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UNIVERSITY OF WINDSOR

WINDSOR, ONTARIO, CANADA

and its

Federated And Affiliated Colleges

ASSUMPTION UNIVERSITY

HOLY REDEEMER COLLEGE

CANTERBURY COLLEGE

•

GENERAL ANNOUNCEMENT
1963-64

•

FACULTY OF ARTS AND SCIENCE
SCHOOL OF BUSINESS ADMINISTRATION
SCHOOL OF NURSING

FACULTY OF APPLIED SCIENCE

FACULTY OF GRADUATE STUDIES

•

FACULTY OF THEOLOGY
(HOLY REDEEMER COLLEGE OF ASSUMPTION UNIVERSITY)

UNIVERSITY OF WINDSOR

GENERAL ANNOUNCEMENT, 1963-64

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FOREWORD

"It is therefore as important to make no mistake in education, as it is to make no mistake in the pursuit of the last end, with which the whole work of education is intimately and necessarily connected. In fact, since education consists essentially in preparing man for what he must be and for what he must do here below, in order to attain the sublime end for which he was created, it is clear that there can be no true education which is not wholly directed to man's last end."

Pope Pius XI, Christian Education of Youth.

65626

UNIVERSITY OF WINDSOR

is a full member of

The University Matriculation Board of Ontario

The National Conference of Canadian Universities and Colleges

The Association of Universities of the British Commonwealth

1963

JANUARY 1963

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JULY 1964

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SEPTEMBER 1964

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OCTOBER 1964

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NOVEMBER 1964

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DECEMBER 1964

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A D D E N D A

Re page 28 - "Miscellaneous fees" ...

Engineering Society fee (compulsory for all students of the Faculty of Applied Science) 4.00

Re page 34 - "Entrance Scholarships" ...

VI. Special scholarships are available for applicants who do not qualify under sections I - V above.

Each applicant will be considered on individual merit, but a minimum average of 75 per cent on nine Grade XIII papers written in one year is required of Ontario applicants, and the equivalent standing is required of other applicants.

The total possible value of each scholarship is $3,000; $600 for the first year and $800 for the second, third, and fourth years.

Re page 40 - "In-Course Bursaries" ...

Essex County Medical Association Bursary. Value: Tuition fees for I Year in a School of Medicine.

This award is made to a resident of Essex County who has completed the pre-medical course at the University of Windsor and who has been accepted in Medicine at a Canadian University.

Applicants must have a minimum average of 66% in the final pre-medical year, and must have some financial need.

Established by the Essex County Medical Association in 1963.

ACADEMIC CALENDAR

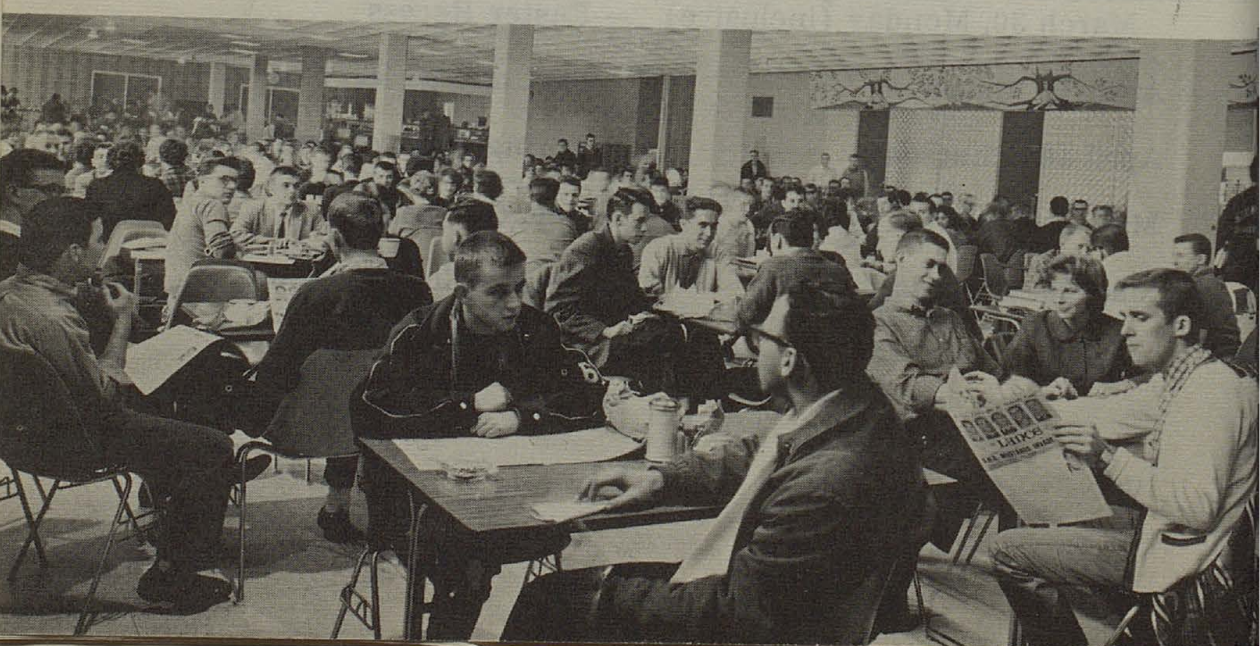
1963

July 2, Tuesday, to August 10, Saturday (inclusive)	—Summer Session
August 19, Monday, to August 21, Wednesday	—Supplemental Examinations
September 11, Wednesday, to September 14, Saturday	—Registration
September 16, Monday	—Lectures begin
September 30, Monday	—Last day of registration for undergraduate courses
October 14, Monday	—Thanksgiving Day
October 18, Friday	—Senate Meeting
October 19, Saturday	—Fall Convocation
December 20, Friday	—Christmas recess begins at 10:00 p.m.

1964

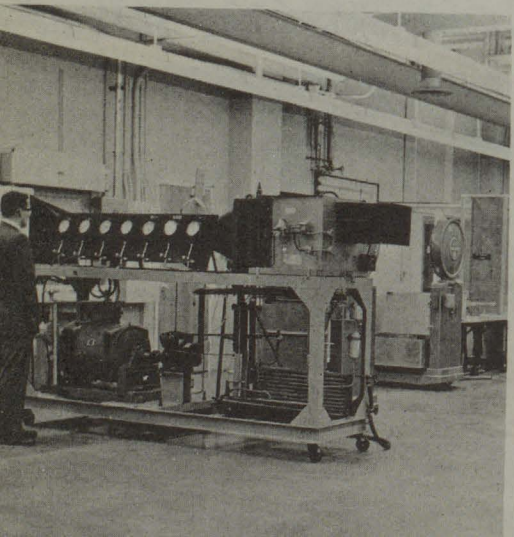
January 3, 4, 6	—Mid-year final examinations
January 7, Tuesday	—Second semester lectures begin
February 14, Friday	—Senate meeting
March 25, Wednesday, to March 30, Monday (inclusive)	—Easter Recess
April 11, Saturday	—Last day of lectures
April 16, Thursday	—Spring final examinations
May 22, Friday	—Senate meeting
May 23, Saturday	—Spring Convocation

The University Centre



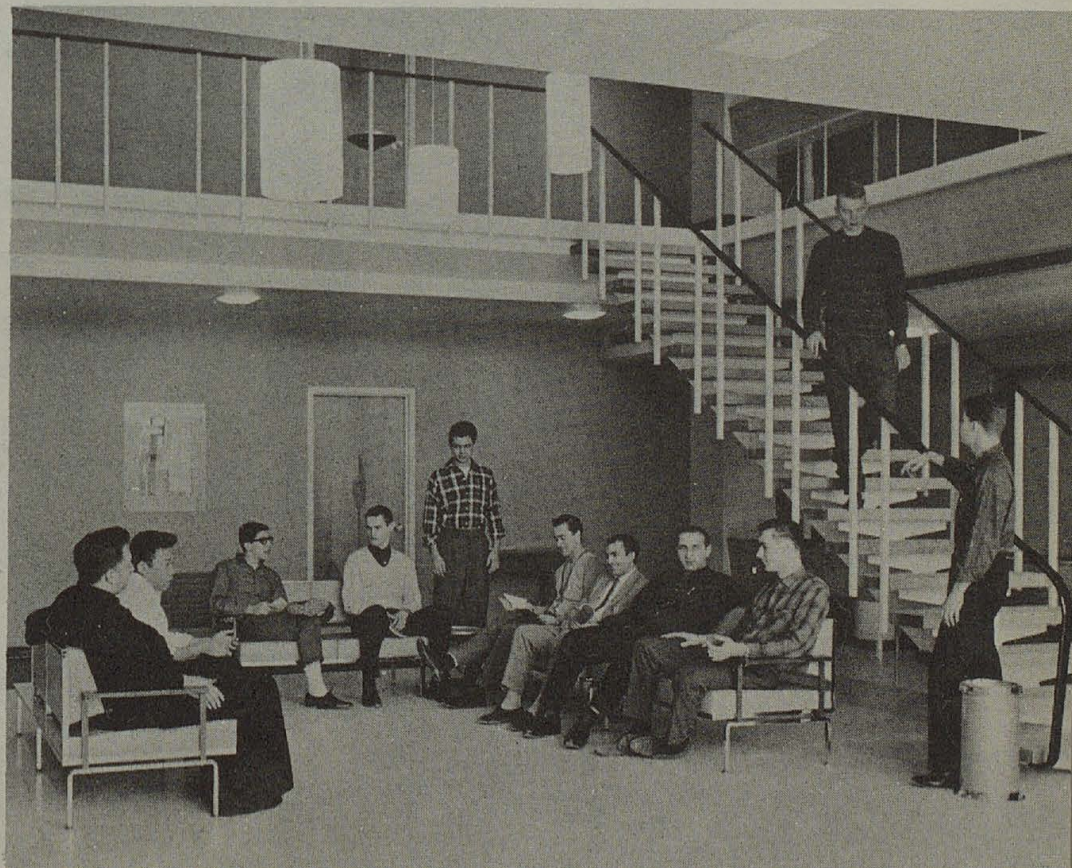
University Library

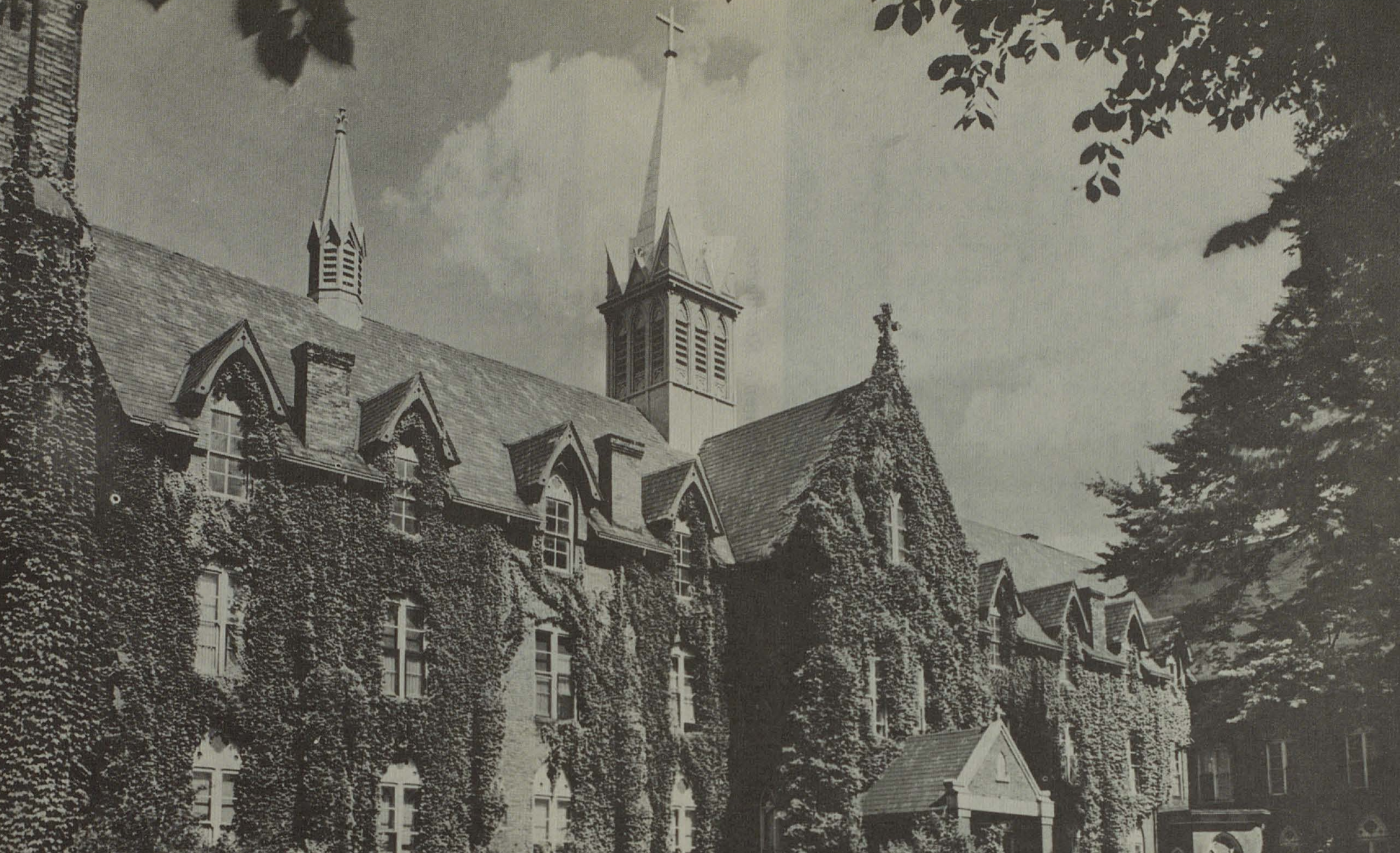
University Life



Electa Hall: Women's Residence

Cody Hall: Men's Residence





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UNIVERSITY OF WINDSOR

BOARD OF GOVERNORS

Member ex officio:

Rev. E. Carlisle LeBel, C.D., C.S.B., M.A., LL.D., Vice-Chancellor and President

Elected Members:

John J. Stuart, B.Comm., Chairman
H. Clifford Hatch, Vice-Chairman
Anthony F. Fuerth, K.S.S., Chairman, Executive Committee
Eli C. Goldin, LL.D.
William T. Grant, B.Comm.
Raymond J. Lyons
G. Malcolm Morton, B.A., M.D., M.Sc., F.R.C.S.(C), F.A.C.S.
John M. Page, C.A.
Ronald W. Todgham
William R. Waddell, M.D.
Richard T. Waddington, B.A.Sc., P. Eng.
George R. Weller
John W. Whiteside, B.A.

Members Appointed by Assumption University:

Rev. Cornelius P. Crowley, C.S.B., Ph.D.
Rev. E. J. McCorkell, C.S.B., M.A., LL.D.
Rev. Hugh V. Mallon, C.S.B., M.A.
Rev. Daniel J. Mulvihill, C.S.B., Ph.D.
Rev. E. Arthur Roberts, C.S.B., B.A., S.T.B.
Rev. Norbert J. Ruth, C.S.B., M.A.

Members Appointed by the Alumni Association:

Joseph R. Deane, LL.B.
James A. Holden, B.A.

Members Appointed by the Lieutenant Governor in Council:

Alphonse Gignac
Richard A. Graybiel, B.A.
Jerome R. Hartford, B.A.
Clare R. MacLeod, B.A., B.Paed.

THE SENATE

Members ex officiis:

The Vice-Chancellor and President, Chairman

The Registrar, Secretary

The Executive Vice-President

The Academic Vice-President

The Dean and Associate Dean of each Faculty

The Director of Each School

The Academic Heads of affiliated or federated Colleges

The Executive Director of Student Affairs

The Director of Extension

The Librarian

The Head or Chairman of each Department in the Faculties of Arts and Science and Applied Science

Elected Members:

Two members from the teaching staff of each Faculty

Appointed Members:

Two members appointed by the Alumni Association

ASSUMPTION UNIVERSITY

Federated with the University of Windsor

BOARD OF GOVERNORS (1962-1963)

Members ex officiis:

Rev. E. Carlisle LeBel, C.D., C.S.B., M.A., LL.D., Vice-Chancellor and President, *Chairman*

Rev. E. Arthur Roberts, C.S.B., B.A., S.T.B., Treasurer.

Rev. Hugh Vincent Mallon, C.S.B., M.A., Executive Vice-President.

Rev. E. Arthur Roberts, C.S.B., B.A., S.T.B., Treasurer.

Very Rev. Joseph C. Wey, M.A., Superior-General of the Basilian Fathers.

Elected Members:

Rev. Norbert J. Ruth, C.S.B., M.A., Dean of Arts and Science and Principal, University College.

Rev. Daniel J. Mulvihill, C.S.B., Ph.D., Vice-President, Development.

Rev. C. P. Crowley, C.S.B., Ph.D., Dean of Graduate Studies.

John W. Whiteside, B.A., Chairman, Essex College Board of Directors.

Representatives:

One representative appointed by each of the affiliated colleges.

HOLY REDEEMER COLLEGE

BOARD OF DIRECTORS

Very Rev. Charles F. DeVine, C.Ss.R., S.S.L., **Principal,** *Chairman.*

Very Rev. George T. O'Reilly, C.Ss.R., *Vice-Chairman.*

Rev. Victor C. Crean, C.Ss.R., *Secretary-Treasurer.*

CANTERBURY COLLEGE

BOARD OF DIRECTORS

The Right Reverend George N. Luxton, B.A., B.D., LL.D., D.D., Bishop of Huron, *Chairman.*

Gordon E. Hunt, *President.*

Lt.-Col. George Y. Masson, E.D., F.R.A.I.C., A.I.A.,*First Vice-President.*

The Rev. A. D. Munro, B.Comm., *Second Vice-President.*

A. E. Garrioch, *Secretary.*

L. F. Ounsworth, M.Sc., *Treasurer.*

The Ven. M. C. Davies, B.A., Archdeacon of Essex.

The Rev. Canon R. C. Brown, M.A., D.D.

The Rev. Canon R. S. Rayson, M.A., S.T.B., D.D.

Rev. Canon Bertram A. Silcox, B.A., L.Th.

Rev. Canon John H. Whealen, B.A., L.Th.

The Rev. Derwyn D. Jones, B.A., L.Th.

Mrs. Wallace R. Campbell, O.B.E., LL.D.

Luther C. Clarke, B.A.

E. Forbes Geddes, Q.C.

Clifford H. Musson

Warwick Plumb

W. Glyn Rogers

S. J. Stodgell

Robert G. Waldron, B.S.

OFFICERS OF ADMINISTRATION

(Assumption University of Windsor — 1962-1963)

Chancellor

His Excellency the Most Reverend John Christopher Cody, D.D., LL.D., Bishop of London.

Vice-Chancellor and President

Rev. Eugene Carlisle LeBel, C.D., C.S.B., M.A., LL.D.

Executive Vice-President

Rev. Hugh Vincent Mallon, C.S.B., M.A.

Vice-President, Development

Rev. Daniel Joseph Mulvihill, C.S.B., Ph.D.

Dean of Arts and Science

Rev. Norbert Joseph Ruth, C.S.B., M.A.

Dean of Applied Science

Frank A. DeMarco, Ph.D., F.C.I.C.

Dean of Graduate Studies

Rev. C. P. J. Crowley, C.S.B., Ph.D.

Dean of Theology

Rev. D'Arcy Lawrence Egan, C.Ss.R., S.T.L.

Principal of Holy Redeemer College

Very Rev. Charles Frederick DeVine, C.Ss.R., S.S.L.

Principal of Canterbury College

The Rev. Canon Robert Spencer Rayson, M.A., S.T.B., D.D.

Director of the School of Business Administration

Gilbert Richard Horne, Ph.D.

Director of the School of Nursing

Florence Martina Roach, R.R.C., Reg.N., B.S., R.R.L.

Director of Extension and Summer School

Rev. Edward Cecil Pappert, C.S.B., Ph.D.

Registrar

Barbara Helen Birch, M.A.

Treasurer

Rev. Edward Arthur Roberts, C.S.B., B.A., S.T.B.

Accountant

Joseph E. Schiller, B.A.

Librarian

William F. Dollar, M.A., A.M.L.S.; Assistant Librarians: J. Emery Kanyasi, B.Sc., A.M.L.S., Technical Services Division; Albert V. Mate, M.A., A.M.L.S., Humanities and Social Sciences Division.

Director of Student Affairs and Dean of Men

Rev. John Alphonse Malone, C.S.B., Ph.D.

Dean of Women

Evelyn Grey McLean, B.A.

Director of Development and Public Relations

John Edward Thompson, M.C., B.A.

Alumni Secretary

Terrance J. Kennedy, B.A.

Director of Christian Culture Series

Rev. J. Stanley Murphy, C.S.B., M.A.

Director of Dramatics

Daniel Patrick Kelly, M.A.

Athletic Staff

Rev. John Michael Hussey, C.S.B., M.A., Chairman, Board of Athletics.

Richard James Moriarty, M.A., Director of Athletics.

Elizabeth Thomson (Mrs. W.), Assistant Director of Athletics (Women).

Director of the University Centre

Herbert Wilshire, B.S., M.S.

Superintendent of Buildings and Grounds

Charles William Morgan, B.Sc., P.Eng.

THE UNIVERSITY AND ITS COLLEGES

LOCATION

The University of Windsor is situated at Windsor, Ontario, on a beautiful hundred-acre campus on the south bank of the historic Detroit River and east of the Ambassador Bridge, which forms a physical link between Canada and the United States.

EARLY FOUNDATIONS

The University of Windsor traces its origin to the inception of Assumption College, which opened its doors on February 10, 1857. The foundation stone of the first building had been laid on June 17, 1855, largely through the efforts of Father Pierre Point, S.J., pastor of Assumption parish in Sandwich. This parish, established as a mission in 1748 and raised to the dignity of a parish in 1767, is the oldest in Canada west of Montreal. M. Theodule Girardot was the first instructor at "Le College de l'Assomption" in 1857.

The College was incorporated by a public Act of the Legislature of the province of Canada which received Royal Assent August 16, 1858. The Corporation consisted of the Bishop of London and the faculty of the College. The Act gave the corporation "full power to make and establish such and so many rules, orders and regulations (not being contrary to the laws of the country or this Act) as they shall deem useful or necessary, as well concerning the system of education in as for the conduct and government of the said College, and of any other institution or school connected with or dependent on the same" (22 Victoria 136).

This Act was passed during the Superiorship of the Basilian Father, Joseph Malbos, who guided the College for one year. After his departure the Jesuits, the Benedictines, and the secular clergy were in charge successively. Finally the Basilians returned in 1870, and the vigorous administration of Father Denis O'Connor (later Bishop of London, and Archbishop of Toronto) laid the foundations of the steady progress that has continued to this day.

The curriculum consisted originally of the classical and commercial courses. To these Father O'Connor added two years of Philosophy, giving the institution a complete high school and Arts course. For many decades the prime concern of Assumption was preparing students for admittance to theological seminaries, although many of her alumni entered business and professional spheres.

AFFILIATION WITH THE UNIVERSITY OF WESTERN ONTARIO

Early in the present century more formal institutions were established in the area for the training of the clergy, and hence a change of emphasis came in the purpose and curricula of the College. The change led in 1919 to affiliation with Western University,

London, Ontario (now the University of Western Ontario). By mutual agreement Assumption College became an integral part of the University's Faculty of Arts and Science. From this time on, Assumption students undertook the same courses and examinations as those in other parts of this Faculty, and received their degrees from the University. During the next thirty years the curriculum was broadened to include General and Honours Courses in Arts and Science, leading to Bachelor of Arts and Bachelor of Science degrees, graduate work in Philosophy leading to the Master of Arts degree, as well as pre-professional programs such as pre-engineering, pre-law and pre-medicine. In this way the College was enabled to prepare its students for many walks of life.

BEGINNING OF CO-EDUCATION

Opportunities for higher education were extended to the women of this area through the opening in 1934 of Holy Names College by the Sisters of the Holy Names of Jesus and Mary, long prominent in local education. From its inception the new College for women was affiliated with Assumption College, which contributed lectures and general supervision. After occupying space for sixteen years in St. Mary's Academy, South Windsor, Holy Names College moved to the main campus of Assumption, which now became co-educational through the merging of the faculties and student bodies of both institutions. In 1962 the Holy Names Sisters withdrew from campus, their residences for women being was enabled to prepare its students for many walks of life.

UNIVERSITY STATUS

In 1953 the Ontario Legislature passed an Act amending the original Act of 1858. This legislation established a new government for the College, consisting of a Chancellor, President, Board of Governors and Senate. It stated further, "The College shall have university powers, including: (a) The power to establish and maintain such faculties, schools, institutes, departments, chairs and courses of instruction as may be determined by the Board; (b) The power to confer university degrees and honorary degrees and awards in any and all branches of learning." As a result, affiliation with the University of Western Ontario came to an end, and Assumption College resumed operation as an independent institution. July 1, 1953.

In June, 1954, the College was admitted to full membership in the National Conference of Canadian Universities, and later the same year, to the University Matriculation Board of Ontario and the Association of Universities of the British Commonwealth. In March, 1956, the Ontario Legislature passed an act which ratified the affiliation of Essex College, and changed the name of Assumption College to Assumption University of Windsor.

ASSUMPTION UNIVERSITY OF WINDSOR

In 1956 the responsibility for the academic work of the University was divided between two corporations. University College, under the direct control of the Board of Governors of the University, retained responsibility for courses in the departments of English, Modern Languages, Philosophy, Religious Knowledge, Economics and Political Science, Psychology, Music, Fine Arts, History, and Home Economics, and relinquished the fields of the natural sciences, Mathematics, Engineering, Business Administration and Nursing to the newly formed Essex College.

Essex College was incorporated in 1954 under the direction of a Board consisting of a representative group of Windsor citizens. In 1956 it affiliated with the University. Operating as a non-denominational institution, Essex College offered courses in Biology, Chemistry, Physics, Mathematics, Geography, Geology; Chemical, Civil, Electrical and Mechanical Engineering; Engineering Physics, Business Administration and Nursing.

HOLY REDEEMER COLLEGE

Holy Redeemer College, the Seminary of the Redemptorist Fathers, was affiliated with the Faculty of Arts and Science in February, 1956, and authorized to give instruction in courses leading to the Bachelor of Arts degree. By an amendment to this affiliation agreement, signed November 30, 1959, the Faculty of Theology was established at the College, and empowered to teach courses leading to the Bachelor of Sacred Theology degree. The College is situated on a large tract of land in South Windsor approximately six miles from the main campus of the University.

CANTERBURY COLLEGE

In November, 1957, Canterbury College, an Anglican liberal arts college, was affiliated with the University and empowered to offer its own courses of instruction in Philosophy, Religious Knowledge and Mediaeval History.

THE UNIVERSITY OF WINDSOR

In order to unify the government of the University under one Board, widely representative of the Windsor community, and to enable the University to expand to meet the needs of the rapidly growing student body by qualifying for grants from the Provincial government, in the Fall of 1962 the Board of Governors of Assumption University, the Board of Directors of Essex College, and the Board of Regents of Assumption University petitioned the Ontario Government for the incorporation of a new University, called the University of Windsor, under a non-denominational Board.

This petition was granted by the passing of the University of Windsor Act 1962-63 by the Ontario Legislature on December 19, 1962.

By the provisions of this Act, Essex College merged with the University of Windsor; Assumption University, while continuing to exist as a corporation, federated with the University of Windsor, and agreed to hold its degree-granting power in abeyance except for degrees in the Faculty of Theology; Holy Redeemer College and Canterbury College affiliated with the new University.

Effective July 1, 1963, the staff and academic departments formerly in the Faculties of Arts and Science, Applied Science and Graduate Studies in Assumption University and Essex College became the initial staff and departments in these same Faculties of the University of Windsor. Thus, the University of Windsor, while new in its foundation and charter, is already old in its traditions and experience.

GENERAL INFORMATION

UNIVERSITY LIBRARY

The present University Library was completed in 1958. Modular in plan, it is 90 feet wide, 190 feet long, and four stories high. It provides shelving for 350,000 volumes and has a seating capacity of five hundred. The open stack arrangement follows the modern practice of placing readers among books.

Special library facilities for faculty and students include study carrells in the stack area, browsing and display areas, seminar rooms, faculty studies. A combined audio-visual and lecture room on the third floor provides all necessary audio-visual equipment and seating for 200 persons. Here the Library Science lectures are given and other lectures when 16 mm. films, filmstrips, pictures or book displays are required.

The Library is intended for purposes of reading and serious study; quiet must be observed at all times. Since smoking space has been provided, smoking is not allowed in the reading and reference rooms, seminar rooms or stairways. Failure to maintain a suitable standard of conduct in the Library, or failure to observe any of the Library regulations may lead to cancellation of Library privileges.

UNIVERSITY CENTRE

The University Centre honours many friends of the University of Windsor who generously contributed to its construction. It is located at the centre of the University campus. In many ways it is the "heart of the campus," because its activities are closely integrated with the interests and activities of the entire University family — students, faculty, alumni, and friends.

It is the goal of the University Centre staff to create a student program which will supplement and implement the University's curriculum. Social and recreational activities, so necessary to the leisure time of students, are balanced with cultural and educational programs to further assist in the intellectual development of students.

The Centre offers faculty and alumni facilities for dining, meetings, social, and cultural activities.

The University Centre contains the University bookstore and provides food service for all students of the University, resident and non-resident. There is also a private dining room for the faculty.

CHRISTIAN CULTURE SERIES

The University brings each year to the campus a group of distinguished lecturers and artists in its Christian Culture Series. This series, established in 1934, is non-profiting, and is supported

by subscriptions and donations. The University makes this contribution to the cultural life of the Windsor-Detroit area. The Series is under the direction of a member of the faculty of the University.

RESIDENCE FACILITIES

Men: Assumption University offers on-campus residence for students from out-of-town in either of two Residence Halls, St. Michael's Hall and the newly completed Cody Hall, with a combined capacity of approximately 350 students. The University feels that the experience in social living thus obtained is an integral part of contemporary education, and so obliges all students not living at home or with close relatives to live in residence for at least one year. This period may be lengthened at the discretion of the Board of Governors as more facilities become available. In addition, a student from out-of-town receiving any financial award within the jurisdiction of the University is obliged to live on-campus during the academic year for which the award is made. By making application for residence, each student implicitly agrees to abide by all regulations. A copy of the general regulations for resident students is available on request.

Women: A residence is maintained by Assumption University on the campus. All women students in Preliminary or First Year not living at home or with immediate relatives are obliged to live in this residence. For details, reservations, etc., contact the Director of Electa Hall, 265 Patricia Road, Windsor, Ontario.

For Senior students, men or women, who wish to live off campus, the University maintains a directory of suitable homes which provide room and board or room only. The directory is available in the office of the Dean of Men or the Dean of Women; each student must live in a house listed in the official directory, and must inform the Dean of his choice of residence and of any subsequent change.

DISCIPLINE

While student activities are democratically conducted with a view to the personal participation of the students in the actual running of affairs, nevertheless the Senate recognizes its responsibility to maintain discipline and enforce regulations in matters affecting the academic progress and the conduct of students. The Senate delegates the Deans of Faculties as its representatives in matters academic, and the Dean of Men and the Dean of Women as its representatives in all other disciplinary matters.

The name of the University may not be used in any publications without the permission of the President. No class or group of students may engage in any public effort as a body representing the University or any organization within the University, without the permission of the President.

The constitution of any proposed club or society must be presented to the Board of Governors for its approval by the Students' Administrative Council before such organization can be recognized.

STUDENTS' ADMINISTRATIVE COUNCIL

The Students' Administrative Council directs and administers all extra-curricular activities and publications in which the interest of students at the University of Windsor is involved. The Council receives and administers all funds accruing from the fees collected by the University for student activities, and promotes inter-university functions when deemed advisable.

The Students' Administrative Council encourages and subsidizes various clubs and societies which offer opportunities to each student to explore the various realms in which he is especially interested. For the musically inclined there are the Glee Club, the Music Appreciation Society, and occasional Musical Evenings. The University Players present three-act plays and a festival of one-act plays each year, plus minor offerings during the year at various functions. There are also the Law Club with its affiliations with Windsor lawyers and law courts, the German Club, the French Club, the Biology Club, the Chemistry Club, and the Psychology Club.

In addition there are organizations which offer inter-university cooperation such as the United Nations Club, World University Students (W.U.S.), National Federation of Canadian University Students. The students, in cooperation with the faculty and international agencies, have conducted several successful seminars on Canadian-American relations, as well as inter-university model assemblies of the United Nations. To students interested in Journalism, the Student's Council offers a chance for active participation and experience on the school paper, the "Lance," and the Year Book, the "Ambassador." The democratic nature of student activities is well illustrated by the production of these publications. The students control their own finances and are responsible for advertising as well as the newsgathering and literary aspects of publishing.

One of the striking characteristics of this University's life is the close and friendly cooperation of students and faculty on a level which transcends the artificial barriers that sometimes lie between faculty and student on the university level. The intimacy that

results serves to round out and integrate the education that the student receives in the lecture hall.

HEALTH SERVICES

An infirmary with a nurse and a visiting staff doctor is provided for the administration of first aid and the treatment of minor ills; the Windsor hospitals are also available for more serious ailments.

Prior to initial registration, each full-time student is required to submit, on a personal health record form, provided by the Registrar's office, a certificate of medical examination performed by his family physician. No student may participate in any athletic activities unless his physician has certified his physical fitness.

The University is not responsible for expenses incurred as the result of injuries sustained by students while participating in athletic activities. Information regarding available accident insurance may be had on request from the Treasurer's office.

INSURANCE

All students from out of town, whether in residence or living off campus, must have hospital insurance. They must present proof of such insurance before admission or sign a document relieving the University of responsibility in case of illness.

Students who are not from Canada or from the United States must have complete insurance as provided by World University Service.

EMPLOYMENT AND PLACEMENT

A placement bureau provides assistance in the obtaining of summer work and permanent employment upon graduation, and to a limited extent part-time employment during the academic year. The Student Placement Bureau cooperates closely with the Civil Service Commission of Canada and the National Employment Service, which appoints a Placement Officer on campus.

The University recognizes that some students must supplement their income by part-time employment during the academic year; it wishes to point out, however, that unless such employment is kept to a minimum, both the student's health and academic standing may suffer. In any case students who must work long hours do not derive full benefit from their university experience and may be required to take a reduced program of studies. A student in such circumstances would be better advised to obtain a loan, or alternatively to postpone his university education until such time as he can afford to devote his full time to the many facets of university life.

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ASSUMPTION UNIVERSITY LIBRARY

COUNSELLING AND GUIDANCE

Each student on registration is assigned a member of the staff as a counselor, who is prepared to give advice on academic matters. Students are free to approach any member of the administrative or instructional staff of the University regarding their education programs, their choice of careers, and their own personal problems. The Psychology department in particular is prepared to offer technical assistance in vocational guidance. Lectures on specific occupational fields are arranged from time to time.

Each new student in the regular winter session may be required, in addition, to take scholastic aptitude tests, as part of the counselling and guidance program, at a time and place designated by his Dean. In the event that a student fails to appear for such tests he may be required to take them at a later date at his own expense.

RELIGIOUS ACTIVITIES

A traditional feature of education at this University is the vitalising influence of religion in the life of the students. Students are encouraged to practise their religion. Religious services and organizations are provided for specific groups.

Catholic students are encouraged to attend Mass daily in Assumption University Chapel at 12:00 noon, and in Assumption Church at 5:00 p.m. They may also participate in the activities of the Legion of Mary and the Sodality.

The Canterbury Club and the United Church Club foster the religious programs of the Anglican and United Church students respectively.

ATHLETIC FACILITIES

The athletic program offers a varied array of intramural and intercollegiate athletics. Eighteen intramural sports in all are offered: Fall program — golf, tennis, track and field, sailing, football, soccer; Winter program — hockey, curling, bowling, basketball, water-polo, swimming, judo, weightlifting, fencing, ping-pong and badminton. Championship intramural teams participate in the International Extramural Conference against representatives from the University of Detroit, Detroit Institute of Technology, and Lawrence Institute of Technology.

In the intercollegiate field, University teams participate in golf, tennis, sailing, track and field, badminton, curling and basketball. Assumption is a full-time member of the Ontario-Quebec Athletic Association, competing with the University of Western Ontario, the University of Toronto, McMaster University, Queen's University and McGill University. Within the framework of the

Ontario Intercollegiate Athletic Association, University teams meet representatives from McMaster, Waterloo, Osgoode, Ontario Agricultural College, Royal Military College, and Ryerson.

St. Denis Hall, the athletic building, houses one of the finest gymnasiums in Canada, with a 90 x 50 basketball court and seating capacity for upwards of 3,000 spectators. Its efficient facilities enable the University to continue as one of the country's leading basketball powers. Equipment is available for weightlifting, badminton, volleyball and judo. A large swimming pool and convenient dressing rooms are available to the students. The campus provides ample space for football, tennis and other sports. These athletic facilities are augmented by the off-campus use of nearby bowling alleys and the Windsor Hockey Arena.

For women on campus, there is an extensive intramural program consisting of basketball, swimming, bowling, tennis, badminton and volleyball. Intercollegiate competition is undertaken with other Ontario universities.

MILITARY TRAINING

Students may apply for training in one of the three Armed Services: the University Naval Training Division, the Canadian Officers' Training Corps, and the RCAF University Squadron. Suitable candidates for each service will be trained for commissioned rank.

Under the ROTP, undergraduates who are successful applicants are enrolled in the service of their choice, as Naval Cadets in the Royal Canadian Navy, Officer Cadets in the Canadian Army, and Flight Cadets in the Royal Canadian Air Force. For further information, students are urged to apply to the service of their choice:

University Naval Training Division

Lt. Commander C. John Metcalfe, R.C.N.(R), B.A., Commanding Officer.

Lt. Commander W. J. Waldron, R.C.N., Staff Officer.

Lt. Robert M. Ryall, R.C.N., Supply Officer.

Canadian Officers Training Corps

Major P. A. Deneau, B.A., Officer Commanding.
Capt. G. S. Kells, B.A., Resident Staff Officer.
Capt. G. A. Mascaro, B.A., Training Officer.

Royal Canadian Air Force University Squadron

S/L W. G. Benedict, B.S.A., Ph.D., Faculty Air Force Representative U. of W.

F/L G. F. Loucks, Staff Officer, U.W.O.

FEES AND FINANCIAL AID

FEES

Fees are subject to change without notice. All fees are for the academic year, except where otherwise indicated.

Full Time

The following schedule lists the minimum amounts payable, including registration, tuition, library, laboratory, examination, graduation, university centre and student activities fees.

Engineering	$550.00
All other courses (undergraduate)	465.00
(graduate)	412.50

Part Time Day (undergraduate or graduate)

Tuition, per hour of instruction a week	35.00
Science laboratory fee, per subject	30.00
Language laboratory fee, per subject	10.00
Psychology laboratory fee, per subject	10.00

For Fees In Extension Division, see page 281.

Miscellaneous fees (payable by all students as incurred

Late Registration: Full-time	20.00
Part-time	5.00
Graduation "in absentia"	10.00
Civil Engineering Camp C.E. 401	50.00
Special and supplemental examination, per subject:	
Regular time and place	10.00
Outside regular time and/or place	20.00
Change of course	2.00
Transcript of record (Official)	1.00
(Unofficial)	.50
Evaluation of documents	10.00

Non-resident fee (applies to all foreign students except those whose parents have taken up permanent residence in Canada)

$20 per subject to a maximum of	$100.00

N.B. (i) Any student taking four courses or more will be charged the fee for full time attendance.

(ii) Graduate students do not pay Student Administrative Council fees. Part-time graduate students pay appropriate fees each year; part-time graduate students will not, however, pay more nor less in total than they would have paid if they had proceeded towards degrees as full-time students.

(iii) For fees in the Evening and Saturday Morning Division and Summer School, see p. 281.

Residence Fees

Room and Board, per academic year:

Women's Residence - private room	$715.00
double room	700.00
Men's Residence	700.00

An extra charge of $15 is made if the residence fee is paid in two instalments.

Each student who wishes to live on campus must send to the Office of the Director of Residence prior to September 1st a deposit of $25, which will be used as a caution fee. A deposit will be refunded if the reservation is cancelled prior to September 1st.

The Residence Council has a right to place a levy against the caution fee for the social and miscellaneous needs of the residences.

A student who withdraws from residence during the academic year may receive a refund only when such withdrawal is occasioned by circumstances beyond the control of the student and has the prior approval of the Dean of Men or of the Dean of Women.

Payment of Bills

Unless otherwise requested, the University presents its bills directly to the student, who assumes responsibility for their payment when due. All fees for the academic year are due and payable on the first day of registration. However, on special arrangements with the Treasurer's Office, fees may be paid in two instalments. A carrying charge is made of $5.00 for full-time students, or $2.00 per subject for part-time or evening division students. The first instalment is due at the time of registration; the second instalment on January 7, 1964, without further notice. ONE PER CENT PER MONTH, OR ANY PART THEREOF, WILL BE CHARGED IN

ADDITION TO THE ABOVE CARRYING CHARGES ON ALL OVERDUE ACCOUNTS. REGISTRATION MAY NOT BE COMPLETED UNTIL FEES ARE PAID OR THE ABOVE SPECIAL ARRANGEMENTS MADE WITH THE TREASURER'S OFFICE.

Failure to pay an outstanding account will bar a student from writing examinations or obtaining credits for previous work.

A reduction is made in the tuition fees of brothers and sisters attending the University simultaneously as **full-time students.**

Withdrawal and Refund Policy

Students who are forced to withdraw from a course or from the University, are required to notify the Registrar in writing and to give their reasons for withdrawal. The obligation of teaching and accommodating a student rests on the University on a yearly basis. Hence:

(1) **All tuition credits or refunds shall be made entirely at the discretion of the university.**

(2) Credits or refunds will be made in the following cases only: (a) Cash refunds may be granted in cases where students are compelled to withdraw on account of serious and continued personal illness. (b) Cash refunds may also be granted in cases where the student is compelled to withdraw for other personal reasons provided these are satisfactory to the University authorities.

(3) The portion of the fee refunded is determined by the date application for refund is received in the Registrar's Office —NOT THE DATE OF WITHDRAWAL. If the application is made during the first week of the semester, a refund of 90% of the semester fees will be returned; during the second week, 80%; during the third week, 60%; during the fourth week, 40%. After the fourth week of each semester no refund will be given. Cheques for refunds will be available only six weeks after withdrawal.

FINANCIAL AID FOR STUDENTS

1. The University welcomes the offer of scholarships, prizes, medals, bursaries and loan funds.

2. Scholarships, prizes, medals, bursaries and loan funds may be accepted from donors at the discretion of the Senate on appropriate recommendation of the President. Awards of scholarships, prizes and medals will be made by the Senate to qualified candidates of merit, but the Senate may withhold any such award if no candidates of merit present themselves. The award of scholarships, prizes and medals shall be final when formally announced by the University.

3. (a) No limitation shall be placed upon the number of prizes and medals which any one student may win in any one year. (b) A student may be declared the winner of as many scholarships as he may win as a qualified candidate of merit, but in the case of awards carrying a major financial amount, such students will normally receive the proceeds only of the largest among these major amounts. (c) Winners of scholarships and prizes may resign the monetary value but retain the honour of such awards, and their names will be published as winners. In cases arising under 3(b) or 3(c), the monetary amounts so relinquished may be awarded by reversion if merited.

4. Undergraduate scholarships and bursaries under the jurisdiction of the University will ordinarily be paid in two instalments, one in the first term and one in the second term, provided that the winners are continuing in their course to the satisfaction of the University. If the work of a student in the first term has been unsatisfactory payment for the second term may be withheld.

5. The University does not guarantee the award of any scholarship, prize, medal or bursary other than those created from funds of the University. Those awards based upon gifts of individuals or associations other than the University will be awarded only after the funds required have actually been received from the donors.

6. A student who has received a scholarship or bursary within the jurisdiction of the University of Windsor may not receive, without permission of the Board of Governors, an official transcript of record prior to graduation, unless he or she repays the entire amount of such assistance.

7. Most of the awards listed below are restricted to students attending the University of Windsor. A few others, which may be held at other Universities, are included because of their particular interest to our students.

   For additional information concerning this latter type of award, see the Dominion Bureau of Statistics publication, "University Entrance Awards," a copy of which may be consulted in the Registrar's Office.

8. In general, the term scholarship signifies an award made because of academic excellence, frequently without relation to financial need, whereas a bursary is awarded to a student with good academic standing and financial need. The distinction between the terms, however, is not rigid.

9. **Unless otherwise indicated, applications for the following awards are to be made to the Registrar (in the case of new students, through their High School Principal prior to May 1; in the case of returning students, directly to the Registrar between September 1 and 15).** An applicant need not specify which award he wishes to receive, except in the case of an award designated below by an asterisk (*), and whose bestowal depends upon the fulfilment of special requirements. The amount of each award may vary with fluctuating economic conditions. **Recipients are free to choose any course for which they have the necessary prerequisites, unless otherwise stated.**

ENTRANCE SCHOLARSHIPS

Awarded By The University of Windsor

The following general conditions apply to all University Entrance Scholarships:

(i) Each applicant must have first class honours standing or the equivalent as determined by the Committee on Student Awards.

(ii) In the case of a candidate applying on the basis of Ontario Grade XIII departmental examinations, the candidate must have written in one year the 9 papers necessary for admission to the course he wishes to pursue, and have a minimum average of 75%.

(iii) Each recipient must enroll in the University for the academic year immediately following the conferring of the award, or forfeit the scholarship.

(iv) Each scholarship may be renewed for a maximum of four years, provided the recipient maintains first class honours standing. In the event that a recipient fails to maintain such average he will lose the scholarship for the ensuing year, but may regain it some subsequent year if he succeeds in once more obtaining the required standing.

(v) If a recipient so desires, payment of all or part of the funds awarded in the first year may be postponed to the second year.

I. City of Windsor and County of Essex.

1. The University is offering to the student standing first in each high school located in the City of Windsor and in Essex County a scholarship of the total possible value of $2400 ($600 a year, renewable for four years).

2. The University is offering to any and all residents of the City of Windsor and Essex County, who complete 9 Grade XIII papers in one year with an average of 75% or better, scholarships covering tuition, but not incidental fees, for a possible total of four years. If a recipient receives other awards during the same academic year which, with this award, total more than $800, the excess over $800 shall be deducted from this award.

II. Province of Ontario outside Essex County.

The University is offering 15 scholarships for students from the Province of Ontario outside Essex County. Details are as follows:

(a) For purposes of distributing scholarships the Province outside Essex County is divided into 13 districts:

1. Kent.
2. Lambton.
3. Middlesex, Elgin, Norfolk, Oxford, Perth, Huron.
4. Brant, Waterloo, Wellington, Dufferin, Grey, Bruce.
5. Wentworth, Halton.
6. Lincoln, Welland, Haldimand.
7. Metropolitan Toronto.
8. York County outside Toronto, Peel, Ontario, Simcoe, Muskoka, Parry Sound.
9. Victoria, Northumberland, Durham, Peterborough, Prince Edward, Haliburton, Hastings, Lennox and Addington, Frontenac.

10. Leeds, Grenville, Dundas, Stormont, Glengarry, Prescott, Russell, Carleton, Lanark, Renfrew.
11. Nipissing, Temiskaming, Cochrane.
12. Sudbury, Manitoulin.
13. Thunder Bay, Rainy River, Algoma, Kenora.

One scholarship will be available to each of the above districts, with the exception of Metropolitan Toronto, where three are available. If there is no eligible applicant in any one district, the award may be transferred to another district with more than one eligible applicant.

(b) The total possible value of each scholarship is $3000, i.e. $600 for the first year and $800 for the second, third and fourth years. So far as the University is concerned, the recipient may hold this scholarship along with any other awards. If the recipient desires, however, payment of part or all of the initial $600 may be postponed to the second year.

III. Canada outside Ontario.

The University offers one scholarship each year to an applicant from Canada outside Ontario; this award has a total possible value of $3200 ($800 per year). Candidates should apply on the basis of senior matriculation in their respective provinces. In places where the equivalent of Ontario Grade XIII is not readily available, candidates may apply on the basis of Junior Matriculation.

IV. United States.

An applicant for one of the following scholarships must be a citizen and resident of the United States; must possess the entrance requirements necessary for the course he wishes to enter (see p. 50); must be in the top quintile of the class; must take the scholastic aptitude test offered by the College Entrance Examination Board on or before December 31 of the year prior to admission; must apply for admission before February 1.

1. Assumption Alumni Scholarships. Value $3200 ($800 per year).
2. Friends of Assumption Foundation, Inc., Scholarships. Value $2000 ($500 per year).

V. Transfer Student.

Awarded to an applicant of outstanding achievement who has completed one year in another Canadian University or college and who must transfer in order to continue the course of his choice. Value $800, renewable on the usual conditions.

Awarded By Other Donors

*Ontario Scholarships

Value: $400. Awarded by the Government of Ontario to applicants whose parents or guardians have been resident in Ontario for at least one year immediately prior to the date of application and who have obtained an average of at least 80 per cent on eight Grade XIII examination papers. Apply through High School Principal.

Alma Mater Association of Saint Mary's Academy Scholarship.

Award of $100 to the student of Saint Mary's Academy who has obtained the highest standing in the Grade XIII examinations, and is recommended by the Principal and staff.

Association of Professional Engineers of the Province of Ontario Scholarship.

Award of $500 to a graduate of Ontario Grade XIII of outstanding ability who registers in the Faculty of Applied Science.

*The Ford Motor Company of Canada Scholarships.

Value: Full academic fees plus living allowance for a maximum of 4 years. Applicants must be children of regular full-time employees earning less than $800 per month with at least two years of continuous service. Apply to Ford Scholarship Administrator, Ford Motor Co. of Canada, P.O. Box 20, Oakville, Ontario.

*H. J. Heinz Co. Scholarship.

Value: $300 a year for a maximum of 4 years. Awarded to a Grade XIII student attending a district high school of Essex and Kent Counties. Apply to the Principal of the High School.

The John B. Kennedy Memorial Scholarships.

Value $300. Two scholarships are awarded annually; one to a graduate of a Canadian, and one to a graduate of an American high school. Each scholarship is renewable annually on the usual conditions to a total possible value of $1,250.

The scholarships are tenable with other entrance scholarships.

These scholarships were established in 1963 through the benefaction of the late John B. Kennedy to Assumption University.

*Hiram Walker and Sons Scholarships.

Value: $850 a year, for a maximum of four years. Awarded to children of employees. Apply to Public Relations Department, Hiram Walker and Sons Ltd., Walkerville, Ontario.

ENTRANCE BURSARIES

*Dominion-Provincial Student-Aid Bursaries, Type A.

Value: $500 for students living away from home; $250 for students living at home. Candidates must be residents of Ontario and in need of financial assistance. They must obtain an average of at least 66 per cent on eight Ontario Grade XIII examination papers. They must be recommended by their high school principals. Application is made through the high school principal before May 1.

*The Atkinson Charitable Foundation Entrance Bursaries.

Value $400 for students living away from home, $200 for students residing within commuting distance of the University. Candidates must be residents of Ontario and in need of financial assistance. They must obtain an average of at least 66% on eight Ontario Grade XIII examination papers, be qualified for entry to the degree course of their choice, and be sponsored by their high school principals. Application should be made through the high school principal before May 1.

University of Windsor Bursaries.

Value: $100 - $400. The university awards a number of bursaries to students at entrance. Candidates must obtain an average of at least 66 per cent on nine Ontario Grade XIII examinations (or the equivalent), and must be in need of financial assistance.

Applications are obtainable from the high school principal or from the Registrar's Office.

Applications must be made before May 1.

Applicants will be considered for a University Bursary only if they have applied for all other bursaries for which they are eligible, especially for the Dominion-Provincial Type A Bursary, and for the Atkinson Charitable Foundation Bursary.

The Rhea Bray Memorial Bursary.

Value: $150. Awarded annually, on the basis of academic merit and need, to a woman student (preferably a freshman) recommended by the Dean of Arts and Science and approved by the Committee on Student Awards. In rare cases may be assigned to the same recipient two years in succession. Established in 1955 by the Zonta Club of Windsor.

*Essex County Pharmacists' Association Bursary.

Value: $200. Offered annually to a student entering First Year Pharmacy from a secondary school in Essex County. Apply to Secretary of the Association.

***The Navy League of Canada Bursaries.**

Value: $250. A number of awards are made each year across Canada to Sea Cadets entering universities and enrolling in the U. N. T. D. For details, applicants may consult the Commanding Officers of their respective Sea Cadet Corps.

***The Windsor and District Labour Council Bursary.**

Value: $300. For children of T.L.C. unionists or other unionists. Applicants must be in financial need and have at least "B" averages. Preference to freshmen.

IN-COURSE SCHOLARSHIPS

Awarded by The University of Windsor.

University "In Course" Scholarships.

To students who are not enjoying continuing scholarships, the University offers "in course" scholarships (each one year in duration) as follows:

1. The following students are eligible for these scholarships:
   (a) The student standing highest in each of Preliminary Year Arts, Preliminary Year Science, I Commerce, II Year Arts (general course), II Year Science (general course).
   (b) The student standing highest in II and III Year of each branch of Engineering and of each group of Honours courses (as defined by the Committee on Student Awards) in Arts, Business Administration and Science, provided the recipient continues in an Honours course or in Engineering.
   (c) The highest three students in each of I Year Arts, I Year Science and I Year Engineering.
2. Each recipient must have a first class honours average and must not be enjoying a continuing scholarship.
3. These scholarships cover tuition (but not incidental fees) for the ensuing year of the course in which the recipient is enrolled.
4. There is to be no reversion in the awarding of these scholarships.

IN-COURSE SCHOLARSHIPS

Awarded by Other Donors

Association of Professional Engineers of the Province of Ontario

Value: $250. One or more awards of $250 to outstanding students in the first, second, and third years of accredited courses in Engineering.

The Canadian Association of Real Estate Boards Scholarship.

Value: $300-500 for one year. Awarded annually to students who are citizens of Canada, have high scholastic ability but limited financial resources, and have completed either first or second year of any degree course. Preference is given to students in Commerce (Business Administration).

The Chemical Institute of Canada (Essex-Kent Section) Award.

Value: $100. Awarded annually on the basis of high standing in Chemistry and of good standing in the other sciences and mathematics, to a student entering the Second Year of any of the Honours Courses in Chemistry, or Chemical Engineering.

Clarkson, Gordon and Company Scholarship.

Value: $100. Awarded annually to a student interested in a public accounting career who has completed the third year of the Honours Course in Business Administration, with a high standing in Business Administration 350 and a good overall average.

Price-Waterhouse and Company Scholarship.

Value: $250. Awarded annually to a student who has completed the third year of the Business Administration course who has an outstanding academic record, and ability and whose interest is in public accounting as a career.

Riddell, Stead, Graham and Hutchison Scholarship.

Value: University fees in the fourth year. Awarded to a male Canadian student who has completed the third year of the Honours Bachelor of Commerce course with high standing who is proceeding to the fourth year, and who intends, upon graduation, to continue studying with a practising firm of Chartered Accountants. The award is made on the recommendation of the Director of the School of Business Administration.

IN-COURSE BURSARIES

***Dominion-Provincial Student-Aid Bursaries, Type B.**

These bursaries are awarded to students who have already completed at least one year of University studies with an average of 66 per cent, and who have financial need. Applications are made through the Registrar of the University before October 15.

I.B.M. Thomas J. Watson Memorial Bursaries.

Value: $100 - $200. These bursaries are awarded annually to students who have completed at least one year of university studies with an average of 66 per cent, and who have financial need.

The bursaries are made possible by an annual grant of $1,000 from International Business Machines Co. Ltd.

A.T.A. Trucking Industry Educational Foundation Bursaries.

In-course bursaries for second or third year students who because of extenuating circumstances are deserving of financial assistance.

Atkinson Charitable Foundation In-Course Bursaries.

These awards are made to deserving students who have already completed at least one year of university work, and show evidence of academic sincerity, future promise and financial need. Applicants must be residents of the Province of Ontario.

University of Windsor Bursaries.

Value: $100 - $400. The university awards a number of bursaries to students in course. Candidates must obtain an average of 66 per cent or second class honours in their final examinations of the previous year and must be in need of financial assistance.

Application forms may be obtained from the Registrar's Office.

Applications must be made before October 1.

Applicants will be considered for a University Bursary only if they have applied for all other bursaries for which they are eligible, especially for the Dominion-Provincial Type B Bursary.

A. R. Davidson Awards.

Value: $100 to a student other than a Canadian or American who is in financial need, who has been in the University for at least one year, and has at least a B average.

Value: $100 to a physically handicapped undergraduate in the next to the last year who is in need of financial assistance and has a satisfactory scholastic record.

The Richard Dean DeLauro Award.

Value: $50. The gift of Professor J. N. DeLauro in memory of his son, awarded to a student who is enrolled in a Second Year Arts program. Conditions of the award are high scholastic standing and financial need.

I.O.D.E. Windsor and Essex County Municipal Chapter Bursaries.

Value: $400-100. Offered to students who have obtained Grade XIII standing in a High School or Collegiate of Essex County, are British subjects by birth or naturalization, and have completed at least two years of their program at university with creditable standing. Apply by June 15.

***The Naval Officers Association of Canada (Windsor Branch) Bursary.**

Value: $150. Awarded annually to a member of the University Naval Training Division, who has completed successfully the first year of his training. For details, consult the Commanding Officer, Windsor U. N. T. D.

Personnel Association of Windsor and District Award.

Award of $100 to an outstanding Canadian student in the third year of the Honours Business Administration course, who shows a high aptitude for personnel and industrial relations work.

Professional Dry Cleaners of Windsor Bursary.

Value $350. Awarded annually to a student who is a graduate of a Windsor and district high school and who has completed at least one year in the university. The award is based on academic standing and financial need.

Windsor Insurance Agents Association Bursary.

Value: $350. Awarded annually to a deserving student who is a resident of Essex County.

The Windsor Junior Chamber of Commerce Bursaries.

Value: $100. Two awards may be made each year to male students of the Windsor area who have already completed one year of university studies at the University of Windsor. Applicants must show evidence of academic achievement and financial need.

SCHOLARSHIPS AND BURSARIES — ANY YEAR, ANY COURSE

Assumption University Bursaries

The following awards are established by funds entrusted to Assumption University. They are tenable in any year, in any degree course, and are awarded on the basis of scholastic standing and financial need.

AWARD	DONOR	AMOUNT
Fred H. Anderson Memorial Bursary	Gotfredson Ltd. and Canadian Fabricated Products Ltd.	$ 250
Dr. Roy Coyle Memorial Bursary	Estate of Dr. Roy Coyle	300
Edmund Girardot Memorial Bursary	Assumption University Trust	200
Msgr. F. X. Laurendeau Memorial Bursary	Friends	150
The First J. C. McGuire Memorial Bursary	J. C. McGuire Estate	250
The Second J. C. McGuire Memorial Bursary	(late member, Board of Regents)	200
Frank McIntyre Memorial Bursary	Assumption University Trust	200
Donald S. McIntyre Bursary	Assumption University Trust	200
Rev. F. X. Semande, C.S.B. Bursary	Rev. F. X. Semande Estate	175
*The Ellen Sullivan and Msgr. F. T. Sullivan Memorial Bursary	Msgr. F. T. Sullivan (Class of 1894)	1,080
Assumption University Bursaries	Assumption University Trust	100-400

*Restricted to graduates of Notre Dame High School, Chattanooga, Tennessee.

The Walkerville and East Windsor, Branch 12, Canadian Legion, B. E. S. L., Bursary.

Value: $250 for two years. Applicants must be residents of Windsor (or children of members of Branch 12). For other conditions of award and application forms, apply to the Registrar of the University.

The Sister M. Electa Memorial Bursary.

Awarded to a woman with satisfactory scholastic standing who is in financial need. This award excuses residence fees (up to $100) for one year.

The Legris Bursary.

Value: $50, established in 1955 by Judge J. A. Legris.

The H. Joseph McManus Scholarship.

Value: $600. Awarded annually at the discretion of the Committee on Student Awards to a deserving student. Established in 1954.

Fred Musson Memorial Bursary.

Value $100. Awarded on the basis of academic standing and financial need to any undergraduate student taking a course in Canterbury College, or to an Anglican student registered in the Faculty of Graduate Studies. Established by Mr. George Musson in memory of his father, the late Fred Musson.

The National Association of Broadcast Employees and Technicians (Local 75) Bursary.

Value $250. Awarded annually by Local 75 to a student in any year in Electrical Engineering who has satisfactory scholastic standing and who is in financial need.

The Odette Bursary in Engineering.

Value: $200. Awarded annually at the discretion of the Committee on Student Awards to a deserving student in Engineering. Established in 1955 by Mr. L. L. Odette, Sr. of Tilbury, Ontario.

The Pennington Bursary.

Value: $100, donated in 1956 by J. C. Pennington of Windsor, Ontario.

The Nathan Tepperman Bursary.

Value: $200. Awarded annually on the basis of scholastic ability or character or financial need or any combination of the foregoing according to the best judgement of the Committee on Student Awards to a deserving student in any year of any course. Established in 1956 by associates of Mr. Nathan Tepperman of Windsor, Ontario.

Rotary Club of Windsor Bursaries.

Value: $100 each. Three bursaries are awarded annually on the basis of scholastic standing and financial need: one to a student enrolled in courses in Canterbury College; one to a student in the Faculty of Arts and Science; and one to a student in the Faculty of Applied Science.

The Dr. Alfred E. Thomas, Sr. Memorial Award.

Value: $300. Awarded annually on the basis of scholastic standing and financial need to a deserving student in any year of any degree course. Established in 1962 by Dr. Alfred E. Thomas, Jr. and Mr. Samuel H. Thomas in memory of their father.

*The Countess Mountbatten Bursary Fund of Canada.

St. John Ambulance National Headquarters, Ottawa, has established a fund, in memory of Countess Mountbatten of Burma, to provide annual bursary assistance for the advancement of nursing.

Besides the Countess Mountbatten Bursary of $600, a limited number of grants of $200 will be awarded each year.

Terms of award are personal and educational qualifications and financial need. Consideration will be given to an applicant with St. John affiliation. Apply not later than June 1st to:

The Chairman,
Countess Mountbatten Bursary Fund Committee,
St. John House, 321 Chapel Street,
Ottawa 2, Ontario.

***The Victorian Order of Nurses Bursaries.**

The Victorian Order of Nurses for Canada offers bursaries of $1,000 to nurses to assist them in taking preparation in Public Health Nursing. Following their course, the recipients are obligated to work one year for the Victorian Order in the area where their services are most urgently needed. Bursaries are also available to students in the final year of a basic degree course which includes preparation in public health nursing.

Apply to: Victorian Order of Nurses,
5 Blackburn Avenue,
Ottawa 2, Canada.

The Women's Auxiliary to The University of Windsor Bursary.

Value: $100. Awarded annually to a student in the humanities.

PRIZES

The Governor-General's Medal.

Awarded annually to a graduating student chosen by the Committee on Student Awards, on the basis of academic performance and contribution to university activities.

The Board of Governors Medals.

Awarded annually to students graduating with the highest standing in each of several courses, and to the undergraduates with the highest standing in each year, regardless of course.

The Dr. Roy J. Coyle Memorial Prizes.

Prizes of $50 each are awarded annually to the students with the highest standings in Zoology 10 and Physics 13. Endowed by the late Dr. Roy J. Coyle of Windsor, Ontario.

The Helena M. Coyle, B.A., Prize.

The interest on $1,000 is offered annually as a prize to the student with the highest standing in English 15.

The H. A. Scarff Memorial Prize.

A prize of $50 awarded annually to the student with the highest standing in Business Administration 250. Established in 1957 by friends of the late Mr. H. A. Scarff, former member of the Senate.

The McManus Memorial Classic Prize.

An annual award of $30 to the best student in Latin 12. Donated in memory of the late Patrick McManus of St. Thomas, Ontario, by his descendants, of whom 11 are alumni of Assumption.

The Society of Chemical Industry Merit Award.

A gold key and one year subscription to "Chemistry and Industry," awarded annually to the student standing highest in the final year of Honours Chemistry, provided he has a minimum average of 75%, and has completed his program in the normal number of years.

The Association of Professional Engineers of Ontario Medal.

A gold medal awarded to the student standing first in the graduating class of the Faculty of Applied Science.

Engineering Institute of Canada Prize.

A prize of $50, awarded in any department of fourth year Engineering, to a student chosen on the basis of academic standing and contribution to activities in the student engineering organization, or in the local branch of a recognized engineering society.

The Essex Deanery Chapter Brotherhood of Anglican Churchmen Award.

An annual award of $100 to the student standing first in Religious Knowledge C10 in Canterbury College.

The Warwick Plumb Award in Philosophy.

An annual award of $50 to the student standing first in Philosophy 15 in Canterbury College.

The Frank D. Brockenshire Memorial Prizes in Creative Writing.

Prizes to the amount of $100 are awarded annually for original contributions in prose and poetry. Donated by Mrs. F. A. Brockenshire.

OTHER FORMS OF ASSISTANCE

Nursing Awards.

For bursaries offered to nurses in post-basic study by the Provincial Department of Health, consult the Director of the School of Nursing.

Provincial Student Aid Loans.

Loans are available from this fund to enable Ontario students who have achieved a 60% average on their previous year's work, to undertake or to continue university courses. Maximum amount for 1 year: ordinarily $500; maximum amount for all years: ordinarily $2,000. The loan is without interest until April 1 in the year following graduation or withdrawal; thereafter, interest at 4% per annum is charged on the unpaid portion. For details, apply to the Registrar.

The Harry E. Carling Student Loan-Fund.

Small sums may be borrowed from this fund by students in good standing who have commenced their studies, but face the possibility of withdrawal as a result of financial difficulties. For details, consult Registrar.

The Harry F. Bennett Education Fund of the Engineering Institute of Canada.

Loans are available from this Fund to enable deserving students who have completed at least one year in engineering to complete their studies. Maximum amount for one year: $250; maximum for all years: $450. The loan is without interest until graduation; thereafter interest at 4% per annum is charged on the unpaid portion. For details apply to Mr. R. G. Billinghurst, E.I.C. faculty representative on campus.

The Children of War Dead (Education Assistance) Act.

Passed on July 1, 1953, this Act provides assistance towards an education beyond secondary school level for sons and daughters of veterans whose deaths were attributable to service in World War I, World War II, or the Korean operations. If the application is approved the Department of Veterans Affairs will pay

(a) to the student, an allowance of $25 per month for the period during which he or she is pursuing a full time course, up to a maximum of 36 months;

(b) to the university, fees and other costs of tuition as described in the Act, up to a maximum of $500 per academic year.

For further details consult the local office of the DVA, or the Registrar.

The Services.

The Royal Canadian Navy, the Canadian Army and the Royal Canadian Air Force (both Regular and Non-Regular) make available on the campus several programs. For financial and other details, see p. 27.

Canadian Forces Medical Undergraduate Subsidization Plan.

This scheme is designed to assist those who wish to make a medical career in one of the Armed Forces. Free academic tuition during the last three years of training in a medical school and other benefits are provided. Although previous training in the services is not an absolute necessity, the application by those who have had training in the UNTD, COTC or URTP will naturally be more favourably received than those who have not had any military experience. Further information may be obtained from Armed Forces representatives on campus.

Transportation Assistance.

Full-time students who reside in the territorial districts of Ontario may apply to the Minister of Education once per annum for sums representing the round trip special student coach-fare less ten dollars from the railroad stations nearest their homes to Windsor. For details, consult the Registrar.

United States Veterans' Benefits.

Qualified United States veterans attending this University may receive certain benefits through the provisions of various Public Laws. For conditions and details, consult the Registrar's Office.

Student Aid Foundation of Michigan.

Students living in metropolitan Detroit, Windsor and Essex County may receive grants and loans for use at this University on the basis of academic record, character and financial need. Applicants should contact the Student Aid Foundation of Michigan, 2486 National Bank Building, Detroit 26, prior to January 15.

POSTGRADUATE AWARDS

Fellowships — A number of fellowships varying in value from $500 to $2,500 are available for graduate students. For details, consult the Dean of Graduate Studies or the Head of the department concerned.

Assistantships — A number of assistantships varying in value from $1,500 to $2,500 are available for graduate students. For details, consult the Dean of Graduate Studies or the Head of the department concerned.

The Canadian Federation of University Women Fellowships — For information and application forms consult the Registrar's Office.

The Province of Ontario Graduate Fellowships — A number of fellowships varying in value from $1,500 to $2,000 will be provided by the Government of Ontario to graduate students who plan careers in university teaching. For details consult the Dean of Graduate Studies.

For detailed information regarding fellowships and scholarships open to graduates of the University of Windsor in Canada and abroad the following publications may be consulted in the Registrar's Office:

Awards for Graduate Study and Research
(Dominion Bureau of Statistics)

Canadian Universities and Colleges
(National Conference of Canadian Universities and Colleges)

United Kingdom Postgraduate Awards

(The Association of Universities of the British Commonwealth)

Study in France

(French Embassy, Ottawa)

Study Abroad

(United Nations Educational, Scientific and Cultural Organization)

ACADEMIC INFORMATION

I. Faculties, Degrees, and Diplomas.

1. The academic work of the University is divided among three Faculties, each under the supervision of a Dean. The School of Business Administration and the School of Nursing are included in the Faculty of Arts and Science. The Faculties, courses, and degrees are as follows:

(a) Faculty of Arts and Science:

Bachelor of Arts (B.A.)

General Course in Arts leading to the B.A. degree.

Honours Courses in Arts leading to the B.A. degree.

Bachelor of Science (B.Sc.)

General Course in Science leading to the B.Sc. degree.

Honours Courses in Science leading to the B.Sc. degree.

Certificate in Public Administration.

School of Business Administration

Bachelor of Commerce (B.Comm.)

Honours Courses in Business Administration leading to the B.Comm. degree.

Diploma Course in Management.

Certificate in Business Administration.

School of Nursing

Bachelor of Science in Nursing Degree (B.Sc.N.)

Diploma Course in Nursing Education.

Diploma Course in Public Health Nursing.

Diploma Course in Nursing Service Administration.

(b) Faculty of Applied Science.

Bachelor of Applied Science (B.A.Sc.)

Honours Courses in Chemical, Civil, Electrical, and Mechanical Engineering and Engineering Science (Engineering Physics), leading to the B.A.Sc. degree.

(c) **Faculty of Graduate Studies:**

Courses leading to the Master of Arts (M.A.);
Master of Science (M.Sc.);
Master of Applied Science (M.A.Sc.);
Master of Business Administration (M.B.A.);
Doctor's Degree (Ph.D.).

In addition to the above three faculties, there is the Faculty of Theology in Holy Redeemer College of Assumption University.

II. Residence and Length of Course.

1. Regular Courses.

Regular courses are offered in the winter session extending from September to May. In general, most courses are continuous throughout the year, but some half-year courses are also offered. Final examinations for half-year subjects of the first semester are written in January.

2. Extension Courses.

Courses are offered through the Extension Division in evening classes during the winter session and in day classes during the summer school. Courses given in the Extension Division carry the same credit as those in regular winter session.

3. Residence and Length of Course.

The number of years of attendance required for the attainment of any degree is as indicated in each program. This time may be reduced at the discretion of the Committee on Admissions through the transfer of credit from another university. In each case attendance at intramural classes for at least one full academic year or the equivalent (three summer sessions or three winter sessions part time, or a combination of these) shall be required.

In the case of programs leading to undergraduate degrees, a candidate may be excused attendance for not more than one full academic year or the equivalent through the transfer of credit obtained by correspondence courses through another university.

A student may take courses for credit in Summer Schools conducted by this or other institutions, subject to approval by his Dean. Such courses, if approved, may be counted towards degrees. Normally, no student, who enters the University with Junior Matriculation standing alone, will be permitted to obtain any Bachelor's degree in less than four complete academic years.

III. Admission Requirements.

1. General Requirements For Admission.

Admission requirements to any part of the University are based on the student's achievement and ability. All applicants will be considered on the basis of total evidence presented: academic records, principal's recommendation, aptitude tests, etc. In special circumstances an applicant may be asked to come to the campus for tests and interviews.

A student whose mother tongue is not English will be required to take the Michigan English Language Institute test as part of his requirements for application.

Specific requirements for admission to the various Faculties and course programs are given with the description of these course programs.

A student admitted to any year with the minimum admission requirements may be placed on probation by the Committee on Admissions. Such a student will be expected to show at all times concrete evidence of serious application to study, and must obtain a C average in order that the probation may be removed. In the event that a student on probation fails his year he is not permitted to repeat, but must withdraw.

2. Admission To Preliminary Year.

The University offers a Preliminary Year which consists of a full year of study equivalent to Grade XIII of the Ontario High Schools or to First Year of those universities which have a four year General Course.

For the program of courses offered in the Preliminary Year and the academic regulations pertaining thereto, see page 82.

3. Admission To First Year.

Admission to First Year of the University is obtained in one of the following ways:

(a) From Grade XIII (Province of Ontario):

For admission to First Year, an average of 60% on nine Grade XIII papers is recommended, and admission may be granted on this factor alone provided the proper subjects are chosen. The subjects required for admission to a particular program are shown along with the courses prescribed for that program.

The Committee on Admissions may admit an applicant to First Year with one condition (i.e., lacking one subject — two papers in one language or any other two papers). This condition must be removed by the candi-

date's carrying an additional course or by writing Grade XIII the following year or by Summer School before the candidate may enter Second Year.

The Committee on Admissions may admit an applicant to First Year with eight papers, without conditions, provided that he has the necessary prerequisites for the program he wishes to enter, and has an average of 66% on the eight papers.

If an applicant has spent one or more years in Grade XIII and lacks more than one subject (as defined in the above paragraph), he may not be admitted but must complete the entrance requirements for First Year by further high school work. (see also pp. 73 and 202).

(b) **From Preliminary Year:**

The satisfactory completion of the Preliminary Year prepares a student for admission to First Year of Arts, Science, Commerce, Nursing, or Engineering, provided the proper subjects are chosen.

(c) **From Outside of Ontario:**

An applicant who has completed High School work outside of Ontario should submit the Departmental or other official certificates (originals) to the Committee on Admissions for a decision regarding eligibility for entrance.

The General Certificate of Education of **Great Britain** (or an equivalent certificate from elsewhere in the Commonwealth) will admit to the First Year provided it indicates satisfactory completion of 5 subjects at the Ordinary level (three of which must be English, another language, Mathematics) and two subjects at the Advanced level, provided the Advanced level subjects are appropriate to the course to which admission is sought.

Graduation from a United States high school will admit to the Preliminary Year provided the applicant has completed at least 16 academic units, including 4 units in English and sequences (at least 2 and preferably 3 units) in each of Mathematics, Science, Social Studies and one foreign language. An applicant for Arts may substitute additional units in another foreign language for either Mathematics or Science. The applicant, in addition, must receive a favourable recommendation from his High School Principal, must rank in the upper half of the class, and on his scholastic aptitude test must obtain a score satisfactory to the Committee on Admissions.

An applicant from Latin America must present a certificate showing satisfactory completion of the bachillerato necessary for admission to university in the applicant's own country.

(d) Adult Students:

A mature student whose secondary education has been interrupted for reasons beyond his control, may be excused part of the normal entrance requirements at the discretion of the Committee on Admissions. Contact the Registrar's office for details.

4. Admission of Transfer Students:

An applicant who wishes to transfer (at any level) from another college or university must arrange for a complete transcript of his record and a statement of honorable dismissal to be sent to the Registrar directly by each institution previously attended.

An applicant who has attended another college or university and who is not eligible to re-register therein may not be admitted to this University.

Every student will be required to complete at least one full year or the equivalent at this University, including at least two courses in his major field, before qualifying for a degree.

5. Admission to Graduate Studies:

See p. 237.

IV. Registration.

1. Application:

Each person seeking admission to the University should apply to: The Registrar,

The University of Windsor,
400 Huron Line,
Windsor, Ontario, Canada.

The Registrar will send the appropriate forms which should be filled out and returned.

In the case of those seeking admission to the regular winter session, this should be done prior to July 1. Earlier application, however, is strongly recommended.

Students who do not have the recommended requirements for regular admission to their program will not be given consideration after September 1; therefore all required documents must be in the Registrar's Office before that date.

A student from outside continental North America must have his application complete and in the Registrar's Office before July 1.

2. **Time and Place of Registration:**

Each student must register at the beginning of each session at the time and place designated by the Registrar. Although the courses selected may be offered in different Colleges of the University, all students register through the Registrar's Office.

Students who fail to register at the time and place fixed by the Registrar will be required to pay a late registration fee (see page 28).

Unless there are exceptional reasons known in advance, no student will be permitted to register later than fifteen days after the beginning of classes.

3. **Classification of Students:**

A full-time student is one who is registered in four or more full undergraduate courses.

A regular student is one who has satisfied all the admission requirements and is pursuing the course program as outlined in the calendar.

A student on probation is one who is placed on probation by the Committee on Admissions or the Committee on Academic Standing. Such a student will be expected to show at all times, concrete evidence of serious application to study, and must obtain a C average during his probationary year in order that the probation may be removed. In case of failure such students will not be permitted to repeat their year but will be required to withdraw.

A student on trial is one who is accepted into a particular course program on trial; if such student shows unsatisfactory progress or fails his year, he will not be permitted to repeat the same course program but will be required to transfer to another.

A conditioned student is a student in any year who has failed to obtain standing in one or more subjects of the preceeding year.

A special student is a student taking courses for credit but not proceeding to a degree at this University.

4. **Regulations Pertaining To Curriculum:**

At registration a course consultant will be provided who will render the student every assistance in planning his program. **Nevertheless, the responsibility for familiarizing himself with the requirements for degrees and with academic regulations rests primarily with the student himself.** At registration, no student may take an additional course, or make any other exception to the approved program as outlined in the calendar without written permission from his Dean.

A student who wishes to participate in more than one extracurricular activity (on or off campus), or who wishes to undertake employment during an academic session, must obtain permission from his Dean before engaging in such activity.

No student who is employed full-time will be permitted to attempt more than three full courses in the winter session, nor more than one full year-course in the summer session.

Every student entering the University in Preliminary or First Year is required to complete satisfactorily a course in Library Science.

Any student of any year who shows an unsatisfactory knowledge of spoken or written English must do additional assignments until his work satisfies his instructors.

5. Change Of Registration:

Once a student has registered, he may not change his course,or add or drop subjects without permission from his Dean, or, in the case of students in the Extension Division, without permission of the Director of Extension. The student must notify the Registrar's Office and the instructor(s) concerned of the change that has been approved, before the change becomes effective.

If any change in fees, or refunds, are involved the student will also see the Cashier's Office. (see page 30).

Any subject dropped without the permission of the Dean will be regarded as a failure.

Students who are forced to withdraw from the University or from a course must notify the Registrar's office in writing, giving the reason for the withdrawal.

V. Examinations.

1. Regular Examinations and Term Work:

The regular examinations will be held in January and May. If a student writes more than one examination in a course, the last mark he obtains shall be the only one considered for academic credit.

In all subjects, the ratio of term-work marks to examination marks is determined by the teaching staff in each subject; neither term mark nor examination mark, however, will count for less than one-third nor more than two-thirds of the final grade. To pass a subject a student must obtain an average of 50% on term work and examination; his Faculty Council, however, may at its discretion

withhold credit if the mark in either term work or examination is below 50%.

Term work in a course will not be credited to a student beyond the year in which the course is taken.

2. **Supplemental Examinations:**

A supplemental examination is one set in a subject in which a student (who has not failed his year) has failed to obtain standing at the regular examination. This examination is held at a time designated by the Dean. A student granted permission to write a supplemental examination must avail himself of this privilege at the first opportunity and the time and place designated; if he does not do so, or attempts the examination but fails, he may not write further supplemental or special examinations in the course involved, but must repeat it in its entirety if he desires credit for it.

Applications for the August supplemental examinations must be in the Registrar's office by July 1; forms for this purpose are available in the Registrar's Office.

The final grade, after supplemental examinations, will include the term mark for the year and the final mark so obtained replaces the mark obtained on the original final examination in calculating the student's grade.

A student who has failed his year is not permitted to write any supplemental or special examinations on the work of that year.

For specific regulations regarding supplemental examinations for each Faculty, see the academic regulations pertaining to the respective Faculty.

3. **Special Examinations:**

A special Examination is an examination other than the regular or supplemental examination in the course involved, Spring or Summer, permitted by the Dean for a grave reason and after special application. No special

examination may be assigned except on the recommendation of the Head of the Department concerned, after consultation with the instructor involved. (Often students should be advised to adopt the alternative of repeating the lectures and taking the next regular examination).

A student who fails to appear for a paper at the time set on the examination timetable will not be allowed to write on the examination paper thus missed, but may be permitted to write a special examination upon fulfillment of the conditions indicated in the above paragraph at a time determined by the Registrar after consultation with the Department and Instructor involved. (For fees, see p. 28).

4. **Conduct of Students during Examinations:**

A candidate writing an examination will write on the paper provided for him; he may not talk to another candidate; he may not copy from another nor allow another to copy from him; he may not bring into the examination room any printed or written material (except such aids as may be specifically permitted for a candidate writing a particular subject).

Any violation of these rules will be regarded as a serious offence, and may lead to the cancellation of the paper(s) of the offending student and even to his expulsion from the University.

5. **Failures:**

A course may be repeated once only.

Subjects which depend directly on the work of a preceding year may not be taken by a student who has failed in the work of the preceding year.

A full-time student who fails his year and who has already failed any year (either here or elsewhere) shall be required to withdraw from full time, part time and extension work permanently.

A full-time student who is repeating his year shall be required to obtain a passing grade in each individual subject of his approved registration at the Spring examinations; a student who fails to meet this requirement shall be required to withdraw.

A student on probation who fails his year may not repeat the year, but must withdraw from the University.

A student who has been required to withdraw from the University for academic reasons, must withdraw from the University for at least one year. He may then petition for re-admission to a different degree program. If re-admitted, such a student will be on probation, and must obtain a C average or withdraw permanently. A student who has been required to withdraw a second time will not be re-admitted under any conditions.

Since the conditions for failing a year vary from faculty to faculty, the student should consult the specific regulations in his own faculty.

6. **Appeals:**

(i) **Aegrotat Standing:** A student who wishes to receive consideration on account of serious illness or bereavement or other grave reason prior to or during the examination should communicate with the Registrar's office before the close of the examination period and should submit supporting documents (e.g., a medical certificate) within a week. In such cases the Committee on Academic Standing may grant standing in the subject or subjects concerned on the basis of the term mark alone.

(ii) **Other Appeals:** While all papers in failed subjects are re-read before the grades are submitted to the Registrar's office, and every care is taken to record marks accurately, any student who considers that some factor affecting the final mark on the examination was not considered by the examiner, may appeal to have the subject reviewed. This request should be submitted in writing to the Registrar's office within two weeks of the official publication of student grades, together with a fee of $10.00. In the event that the grade is changed as a result of the appeal, the fee will be refunded.

Appeals should be addressed to the Secretary of the appropriate Faculty Council, and sent to the Registrar's office.

VI. Graduation.

Registration in any program does not constitute an application for a degree or diploma.

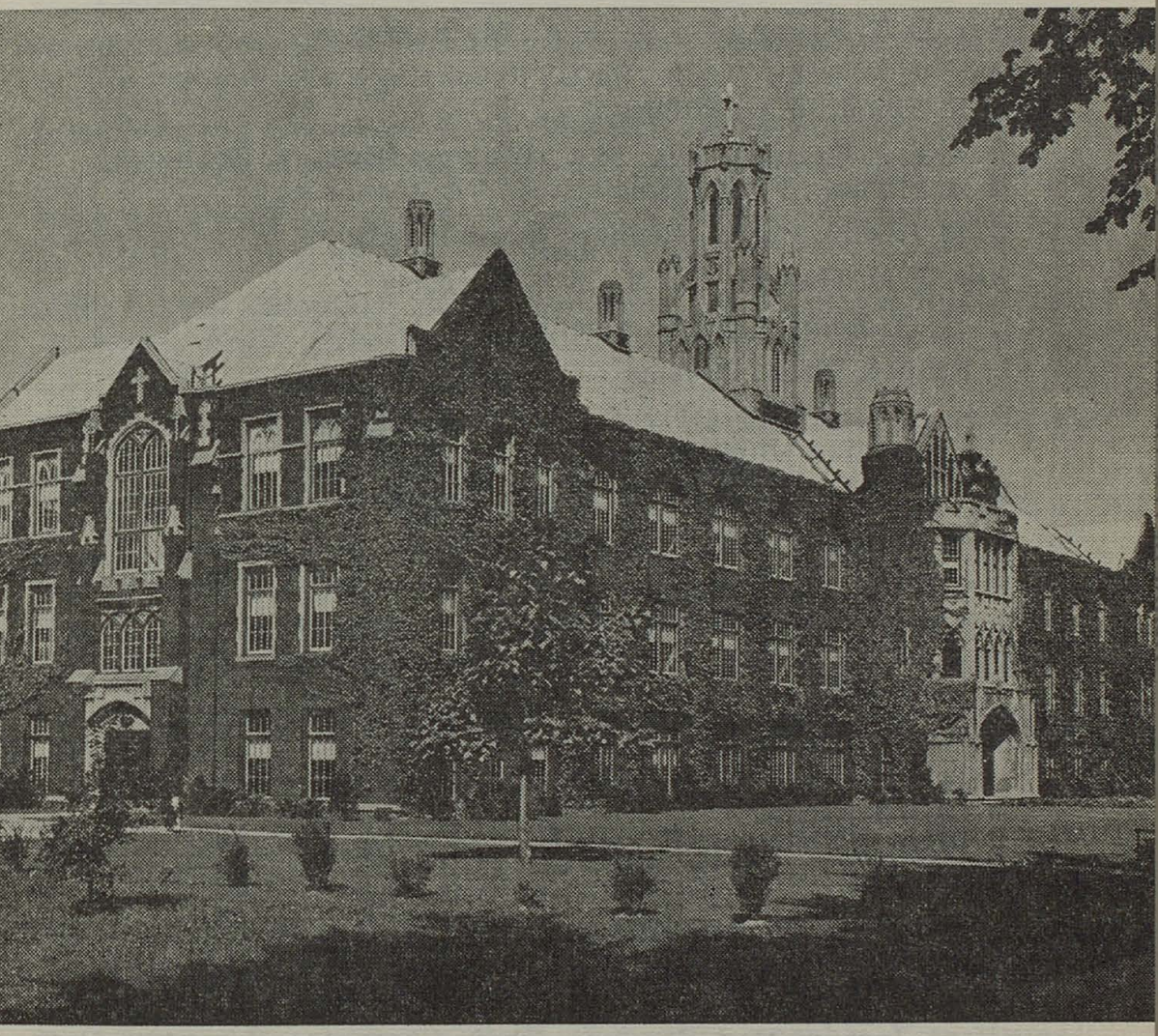
An official application for graduation must be filled out and filed in the Registrar's Office 30 days prior to the Convocation at which the applicant hopes to graduate.

In cases in which credit is sought for work done elsewhere, official transcripts or other documentary evidence required by the Registrar's Office, not already submitted, must be conveyed to the Registrar's Office prior to the same date. Failure to comply with these regulations will disqualify the student for graduation at the Convocation concerned.

Each prospective graduate must be present in person at Convocation in order to receive his degree, unless excused for a serious reason by his Dean, and unless arrangements have been made with the Registrar to receive the degree in absentia.

For particular regulations of the Faculty of Arts and Science see p. 73 ff; for the Faculty of Applied Science, p. 202 ff; for the Faculty of Graduate Studies, p. 237 ff.

THE FACULTY OF ARTS AND SCIENCE



Dillon Hall

THE FACULTY OF ARTS AND SCIENCE

Faculty Council

The Dean of Arts and Science, Chairman; the President; the Executive Vice-President; the Registrar; the Associate Dean of Arts and Science; the Principals of the Colleges in the Faculty of Arts and Science; the Heads of Departments and Directors of Schools in the Faculty of Arts and Science, as follows:

Rev. C. P. J. Crowley, C.S.B., Ph.D., English (Speech, Drama)

Rev. C. J. Drouillard, C.S.B., Ph.D., Modern Languages

Rev. D. T. Faught, C.S.B., M.A., Mathematics

Rev. R. C. Fehr, C.S.B., Ph.D., Psychology
P. F. Flood, M.A., Philosophy

Rev. A. J. Grant, C.S.B., M.A., Biology (Botany, Zoology)
R. A. Helling, Ph.D.,Sociology and Anthropology

G. R. Horne, Ph.D., Business Administration

Rev. J. M. Hussey, C.S.B., M.A., Classics

H. H. G. Jellinek, Ph.D., Chemistry

L. Krause, Ph.D., Physics

Rev. L. A. McCann, C.S.B., S.T.D., Religious Knowledge (Assumption University).

Rev. D. J. Mulvihill, C.S.B., Ph.D., History

W. G. Phillips, Ph.D., Economics and Political Science

Rev. Canon R. S. Rayson, M.A., S.T.B., D.D., Religious Knowledge (Canterbury College)

Florence M. Roach, R.R.C., B.S., Reg.N., R.R.L., Nursing

Officers of Instruction (1962-63)—Full time

(The year of first appointment to the Faculty of Arts and Science is given).

John Abramowich; B.Sc. (Alberta), M.A. (Toronto), Ph.D. (California). Assistant Professor of Mathematics—1960.

Rev. Arthur Edward Alexander, C.Ss.R.; Ph.L. (Fribourg). Assistant Professor of Philosophy—1957.

Rev. Elliot B. Allen, C.S.B.; B.A. (Toronto), M.A. (ibid.), M.S.L. (Pont. Inst. of Med. Studies), Ph.D. (Toronto). Associate Professor of Philosophy—1962.

Vincent Almazan; B.A. (Valencia), Lic.-es-lettres (Strasbourg). Assistant Professor of Modern Languages—1962.

Lucio Artiaga; B.A. (Zaragoza), M.Sc. (Dalhousie). Assistant Professor of Mathematics—1962.

Winfred Gerald Benedict; B.S.A. (Toronto), Ph.D. (ibid.). Associate Professor of Biology—1957.

Cecil Mackintosh Birch; B.A. (Western Ontario), M.A. (Toronto), Ph.D. (ibid.). Associate Professor of Business Administration —1959.

Rev. Frank John Boland, C.S.B.; B.A. (Toronto), M.A. (Detroit), Ph.D. (Ottawa). Associate Professor of History—1955.

Irvin Henry Brockman; B.E. (Saskatchewan), M.Sc. Lecturer in Physics—1958.

Jerome Brown; B.A. (Iona College), M.A. (Toronto). Lecturer in Philosophy—1961.

John Maxwell Brownlie; B.A. (Western Ontario), M.B.A. (Michigan). Assistant Professor of Business Administration—1958.

*Rev. John Francis Callaghan, C.S.B.; B.A. (Toronto), M.A. (ibid.). Assistant Professor of Economics—1957.

Louis Lorne Campbell; B.Sc. (Manitoba), M.S. (Iowa State College), Ph.D. (Toronto). Associate Professor of Mathematics —1958.

John Richard Catan; B.A. (Cathedral College, Brooklyn), M.A. (Toronto). Lecturer in Philosophy—1962.

Vladimir Bohdan Cervin; B.A. (Vienna, Austria), B.Sc. (ibid.), D.S.S. (Brussels), Ph.D. (Prague). Associate Professor of Psychology—1961.

Eric Wyllis Channen; B.A. (Hons.) (Toronto), Ph.D. (ibid.). Assistant Professor of Chemistry—1960.

Vincent Casmere Chrypinski; M.L. (Catholic U. of Lublin, Poland), M.A. (Wayne), Ph.D. (Michigan). Associate Professor of Political Science—1957.

David R. Cole; B.A.; M.A. (Bowling Green). Lecturer in Sociology —1962.

Rev. Cornelius Patrick Joseph Crowley, C.S.B.; B.A. (Toronto), M.A. (Michigan), Ph.D. (ibid.); Dean of Graduate Studies, 1959. Professor and Head, Department of English—1944.

Rev. Edward J. Crowley, C.Ss.R.; B.A. (St. Joseph's, New Brunswick), S.T.L. (Catholic U. of America), S.S.L. (Pontifical Biblical Institute, Rome). Assistant Professor of Religious Knowledge and Theology—1957.

*On leave, 1962-63

Stanley B. Cunningham; B.A. (Manitoba), M.A. (Toronto). Lecturer in Philosophy—1961.

Rev. James Daley, C.S.B.; B.A. (Western Ontario), M.A. (Toronto), S.T.B. (St. Michael's, Toronto). Lecturer in Philosophy—1959.

Helen Canniff DeAlvarez (Mrs.); B.A.; M.A.; Lecturer in Philosophy —1962.

John Norbert Deck; B.A. (Western Ontario), M.A. (ibid.), Ph.D. (Toronto). Assistant Professor of Philosophy—1957.

Joseph Nicola DeLauro; B.F.A. (Yale), M.F.A. (Iowa). Associate Professor of Fine Arts—1960.

Frank A. DeMarco; B.A.Sc. (Toronto), M.A.Sc. (ibid.), Ph.D. (ibid.); Dean of Applied Science. Professor of Chemistry—1946.

Robert Joseph Doyle; B.A. (Western Ontario), M.A. (ibid.), M.S. (Michigan State), Ph.D. (Wayne State). Associate Professor of Biology—1948.

Rev. Clarence Joseph Drouillard, C.S.B.; B.A. (Toronto), M.A. (ibid.), Ph.D. (Laval). Professor and Head, Department of Modern Languages—1956.

Rev. D'Arcy Lawrence Egan, C.Ss.R.; S.T.L. (Catholic U. of America). Associate Professor of History and Religious Knowledge—1957.

Hermes Andrew Eliopoulos; B.Sc. (Salonika, Greece), M.Sc. (McGill), Ph.D. (Toronto). Associate Professor of Mathematics —1956.

Zbigniew Marian Fallenbuchl; B.Sc. (Econ.) (London), M.A. (Montreal), Ph.D. (McGill). Associate Professor of Economics and Acting Head, Department of Economics and Political Science in 1962-63—1957.

Charles Fantazzi; A.B. (Catholic U. of America), M.A. (ibid.). Assistant Professor of Classics—1960.

John Kevin Anthony Farrell; B.A. (Western Ontario), M.A. (ibid.), Ph.D. (Ottawa), F.R.S.A. Assistant Professor of History—1962.

Rev. Donald Thomas Faught, C.S.B.; B.A. (Toronto), M.A. (Michigan). Associate Professor and Head, Department of Mathematics—1954.

Rev. Robert Charles Fehr, C.S.B.; B.A. (Toronto), M.A. (Detroit), Ph.D. (Fordham). Associate Professor and Head, Department of Psychology—1951.

Rev. John Joseph Fiore, C.S.B.; B.A. (Toronto), S.T.B. (St. Michael's, Toronto). Lecturer in Religious Knowledge and Music—1961.

Patrick Francis Flood; B.A. (Western Ontario), M.A. (ibid.). Associate Professor and Head, Department of Philosophy—1945.

Rev. Robert Henry Flood, C.S.B.; B.A. (Toronto), M.S.L.S. (Catholic U. of America). Assistant Professor of English—1960.

John Blake Gertz; B.S. (Detroit), M.B.A. (Ohio State). Assistant Professor of Business Administration—1957.

William John Gillen; B.A., M.A. (Toronto). Assistant Professor of Economics—1959.

Joseph Martin Graham; B.A. (Western Ontario), M.A. (ibid.), Ph.D. (Notre Dame). Assistant Professor of Philosophy—1959.

Rev. Alexander John Grant, C.S.B.; B.A. (Toronto), M.A. (St. Bonaventure). Professor and Head, Department of Biology—1945.

Edwin Emile Habib; B.Sc. (Birmingham), Ph.D. (McMaster). Assistant Professor of Physics—1958.

Wilfred Hanson; B.Comm. (Saskatchewan), M.B.A. (Western Ontario). Assistant Professor of Business Administration—1958.

Nigel Edward Hedgecock; B.A. (British Columbia), M.A. (ibid.), Ph.D. (McMaster). Assistant Professor of Physics—1961.

Rudolf A. Helling; B.A. (Wayne State), Diplom-Sozialwirt (B.D.V.) (Wilhelmshavn), Ph.D. (Wayne State). Assistant Professor of Sociology and Head, Department of Sociology and Anthropology—1956.

Rev. Henry Gordon Hill, O.G.S.; B.A. (Queen's), (Cambridge), M.A. (Cambridge). Associate Professor of History—1961.

William John Holland; B.Sc. (Queen's), M.Sc. (Wayne), Ph.D. (ibid.). Assistant Professor of Chemistry—1960.

Frank Holuj; B.Sc. (London, England), M.Sc. (McMaster), Ph.D. (ibid.). Assistant Professor of Physics—1961.

Gilbert Richard Horne; B.A. (Western Ontario), M.A. (Michigan), Ph.D. (ibid.). Professor and Director, School of Business Administration—1931.

John Huschilt; B.A. (Toronto), M.A. (ibid.), Ph.D. (Wayne State). Assistant Professor of Physics—1953.

Rev. John Michael Hussey, C.S.B.; B.A. (Toronto), M.A. (Catholic U. of America). Professor and Head, Department of Classics —1941.

Ruth Ingram; B.Sc.N. (P.H.N., Alberta), M.N. (N.Ed., P.H.N., Washington), Reg. N. Instructor in Nursing—1961.

Hans H. G. Jellinek; Ph.D. (London Imperial College), Ph.D. (Cambridge), D.I.C. Professor and Head, Department of Chemistry —1959.

Rev. Kleinnart Joseph Johnson, C.Ss.R.; M.A. (Catholic U. of America), B.A. (Western Ontario). Assistant Professor of English—1946.

Daniel Patrick Kelly; B.A. (Toronto), M.A. (ibid.). Assistant Professor—1958.

Rev. Frederick Temple Kingston; B.A. (Toronto), M.A. (ibid.), L.Th. (ibid.), B.D. (ibid.), D.Phil. (Christ Church, Oxford). Professor of Philosophy—1959.

*Matti Tapio Klemola; Mag. Phil. (Helsinki), Ph.D. (ibid.). Assistant Professor of Mathematics—1960.

Rev. George Watka Kosicki, C.S.B.; B.A. (Western Ontario), M.S. (Michigan), Ph.D. (ibid.). Assistant Professor of Chemistry —1956.

Aranka Eve Kovacs; B.A. (McMaster), M.A. (Toronto), Ph.D. (Bryn Mawr). Assistant Professor of Economics—1961.

Lucjan Krause; B.Sc. (London, England), M.A. (Toronto), Ph.D. (ibid.), A.Inst.P. Associate Professor and Head, Department of Physics—1958.

Calvin Charles Kuehner; B.Sc. (Ohio State), M.Sc. (ibid.), Ph.D. (ibid.). Associate Professor of Biology—1958.

Eugene D. LeMire; Ph.B. (Detroit), M.A. (ibid.), Ph.D. (Wayne State). Assistant Professor of English—1962.

Rev. Leonard Albert McCann, C.S.B.; B.A. (Western Ontario), S.T.B. (Angelicum, Rome), S.T.L. (Laval), S.T.D. (ibid.). Professor and Head, Department of Religious Knowledge in Assumption University—1952.

Lillian Margaret McCarthy; B.A. (Toronto), M.A. (ibid.), Ph.D. (ibid.). Associate Professor of Modern Languages—1958.

Rev. Edmund Joseph McCorkell, C.S.B.; B.A. (Toronto), M.A. (Catholic U.), LL.D. (Ottawa). Professor Emeritus of English —1961.

Rev. Joseph John McCormick, C.Ss.R.; B.A. (Western Ontario), M.A. (ibid.). Assistant Professor of History—1946.

*On leave, 1962-63

Howard Douglas McCurdy; B.A. (Western Ontario), B.Sc., M.Sc. (Michigan State), Ph.D. (ibid.). Assistant Professor of Biology —1959.

Rev. Daniel Gordon Macdonald, C.S.B.; B.A. (Toronto), M.A. (ibid.). Lecturer in Classics—1958.

Rev. Thomas McGouey, C.S.B.; B.A. (Western Ontario). Assistant Professor of Psychology—1949.

Eugene Joseph McNamara; A.B. (DePaul), A.M. (ibid.). Assistant Professor of English—1959.

Rev. Hugh Vincent Mallon, C.S.B.; B.A. (Toronto), M.A. (Michigan). Executive Vice-President and Professor of English—1961.

Rev. John Alphonse Malone, C.S.B.; B.A. (Western Ontario), M.A. (Toronto), Ph.D. (Fordham). Associate Professor of Psychology—1959.

Mary J. Manley; B.A. (Western Ontario), M.A. (Yale), Ph.D. (ibid.). Associate Professor of English—1952.

Sr. Marian Dolores, S.N.J.M.; B.A. (Marylhurst), M.A. (Loyola, Chicago), Ph.D. (ibid.). Visiting Professor of Psychology—1959.

Reginald Albert Moore; B.Sc. (McMaster), M.Sc. (ibid.), Ph.D. (Alberta). Assistant Professor of Physics—1962.

Marie Lucille Moss; B.S. (Nebraska), M.S. (Minnesota). Assistant Professor of Biology—1955.

Rev. Daniel Joseph Mulvihill, C.S.B.; B.A. (Western Ontario), M.A. (Michigan), Ph.D. (ibid.); Vice-President Development. Professor and Head, Department of History—1942.

Rev. John Clifford Murray, C.S.B.; B.A. (Western Ontario), S.T.B. (St. Michael's, Toronto), S.T.L. (Angelicum, Rome), S.T.D. (ibid.). Assistant Professor of Religious Knowledge—1960.

T. D. Nainan; B.Sc. (Travancore), M.Sc. (Bombay), Ph.D. (Indiana). Assistant Professor of Physics—1961.

Ralph Carl Nelson; B.A. (DePaul), M.A. (ibid.), Ph.D. (Notre Dame). Assistant Professor of Philosophy—1961.

Robert Joseph Niedzielski; B.S. (Aquinas), M.S. (Illinois), Ph.D. (ibid.). Assistant Professor of Chemistry—1962.

Rev. William Francis Nigh, C.S.B.; B.A. (Western Ontario), M.A. (Houston). Assistant Professor of Mathematics—1946.

Rev. John Michael Curtis O'Donoghue, C.S.B.; B.A. (Toronto), M.A. (ibid.). Assistant Professor of Modern Languages—1959.

Rev. John Patrick O'Meara, C.S.B.; B.A. (Toronto), M.A. (Wayne State), Ph.D. (Ottawa). Associate Professor of History—1959.

George Arthur Padley; B.A. (Leeds), Dip.Ed. (ibid.), Dr. de L'U (Paris). Assistant Professor of English—1960.

Rev. Edward Cecil Pappert, C.S.B.; B.A. (Toronto), M.A. (Detroit), Ph.D. (Ottawa); Director of Extension, 1958. Assistant Professor of English—1950.

Sister Pauline of Mary, S.N.J.M.; B.A. (Western Ontario), M.A. (Laval). Assistant Professor of Modern Languages--1950.

Rev. Ronald Stanley Pazik, C.S.B.; B.A. (Western Ontario), M.A. (Toronto). Assistant Professor of Modern Languages—1955.

Michael Luke Petras; B.Sc., M.Sc. (Notre Dame). Assistant Professor of Biology—1956.

Brother Roger Philip, F.S.C. (William James Overend); B.A. (Toronto), M.A. (ibid.), Ph.D. (Catholic U. of America). Professor Emeritus, Department of Psychology—1956.

*William Gregory Phillips; B.A. (Toronto), M.A. (ibid.), Ph.D. (ibid.). Professor of Economics and Head, Department of Economics and Political Science—1950.

Homer Frederick Plante; B.A. (Western Ontario), M.A. (Toronto). Assistant Professor of English—1956.

Rev. Raymond D. Powers, C.Ss.R.; M.A. (Catholic U. of America). Assistant Professor of Philosophy—1957.

Stanley James Whitworth Price; B.A. (British Columbia), M.Sc. (ibid.), Ph.D. (Edinburgh). Assistant Professor of Chemistry —1959.

Rev. Canon Robert Spencer Rayson; M.A. (Queen's), S.T.B. (General Theological Seminary, New York), D.D. (Anglican Theological College of B.C.), (Trinity); Principal, Canterbury College, 1957. Professor and Head, Department of Religious Knowledge in Canterbury College. Lecturer in History—1958.

Rev. Maurice Adrian Record, C.S.B.; B.A. (Western Ontario), M.A. (Toronto). Associate Professor of Psychology—1952.

Florence Martina Roach; R.R.C., Reg.N., B.S. (Seton Hall), R.R.L. Assistant Professor and Director, School of Nursing—1955.

Sr. Mary Romana, S.N.J.M.; B.Sc. (Nazareth College), M.S. (Michigan State). Lecturer in Home Economics—1959.

Rev. Norbert Joseph Ruth, C.S.B.; B.A. (Toronto), M.A. (ibid.); Dean of Arts and Science. Special Lecturer in Philosophy of Science—1951.

*On leave, 1962-63

Kenneth Gerald Rutherford; B.A. (Western Ontario), Ph.D. (Wayne State). Associate Professor of Chemistry—1958.

Leta Grace Sanders; Reg.N.; Cert. in Teaching and Supervision (Western Ontario), B.S. (Columbia), M.A. (ibid.). Lecturer in Nursing—1960.

Walter Sylvester Skakoon; B.A. (Western Ontario). Lecturer in Modern Languages—1962.

Alexander Cormac Smith; B.Sc. (Dublin), M.Sc. (ibid.), Ph.D. (ibid.). Associate Professor of Mathematics—1963.

Alfred Arthur Smith; B.A. (Queen's), M.A. (ibid.), Ph.D. (McGill). Associate Professor of Psychology—1959.

Meyer W. Starr; B.A. (Toronto), M.A. (Princeton). Lecturer in Psychology—1961.

John Francis Sullivan; B.S. (Detroit), M.A. (ibid.), Ph.D. (Michigan). Associate Professor of English—1958.

Albert A. Thibault; A.B. (Boston College), Licence-es-Lettres (Paris), M.A. (Harvard), Docteur-es-Lettres (Laval). Associate Professor of Modern Languages—1953.

Roger Joseph Thibert; B.A. (Western Ontario), M.S. (Detroit), Ph.D. (Wayne State). Associate Professor of Chemistry—1953.

Paul Ernest Vandall; B.A. (Western Ontario), M.A. (ibid.). Assistant Professor of Geography—1952.

Arie van Wijngaarden; B.Sc. (McMaster), Ph.D. (ibid.). Assistant Professor of Physics—1961.

Sadanand Verma; B.Sc. (Patna), M.Sc. (Bihar), Ph.D. (Wayne State). Assistant Professor of Mathematics—1959.

Milorad Nicolas Vuckovic; B.A., M.A. Lecturer in History—1960.

Hugh Nevin Wallace; B.A. (Alberta), M.A. (Toronto). Lecturer in History—1962.

Rev. Arthur Jerome Weiler, C.S.B.; B.A. (Toronto). Lecturer in Modern Languages and Geology—1937.

Walter LeRoy White, D.F.C.; B.A. (Western Ontario), M.A. (Toronto). Associate Professor of Political Science—1956.

Rev. Peter Frederick Wilkinson; B.A. (Toronto), M.A. (ibid.), L.Th. (Wycliffe). Lecturer in Philosophy, Canterbury College—1962.

Batia Zakon (Mrs. E.); M.A. (University of Wilno). Lecturer in Modern Languages—1958.

Elias Zakon; Mgr. Phil. (Stefan Batory U., Wilno), Dr. jur. (ibid.). Associate Professor of Mathematics—1957.

*Walter Zayachkowski; B.A. (Saskatchewan), M.A. (ibid.). Lecturer in Mathematics—1960.

Michael Zin; B.Comm., M.B.A. (Michigan), Ph.D. (ibid.). Associate Professor of Business Administration—1956.

*On leave, 1962-63

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Sessional and Part Time Appointments

Rosella Millwood Birch (Mrs. C. M.); B.A. (Toronto); M.A. (ibid.). Lecturer in English—1962.

David James Foulis; Ph.D. (Tulane). Special Lecturer in Mathematics—1962.

Violet Webb Leach (Mrs. J. D.); L.C.M. (London), C. of M. (ibid.), M.A. (Wayne). Instructor in Music—1943.

Robert Walter Meanwell; B.A. (Western Ontario), Chartered Accountant. Instructor in Business Administration—1954.

Armando Ortiz; B.Sc. (National U. of Mexico), M.D. (ibid.). Research Associate in Psychology—1961.

Franz Karl Schnitzer; Ph.D. (Graz). Special Lecturer in Mathematics—1962.

Nicholas John Siller; B.A. Instructor in Geography—1962.

Virginia Standridge (Mrs.); M.H.E. (Naples). Lecturer in Modern Languages—1962.

Richard Alan Waterman; B.A. (Santa Barbara), M.A. (Claremont), Ph.D. (Northwestern). Instructor in Anthropology—1962.

Arthur Burton Weingarden; B.A., Barrister-at-Law (Osgoode). Instructor in Business Administration—1960.

Patrick James Young; B.A., M.A. (Toronto). Sessional Lecturer in Economics—1962.

Department of Extension

In addition to regular members of the staff, the following served as special lecturers:

Evening Classes, Winter 1962-63

L. N. Baldock, Industrial Organization and Management.

J. M. Hunt, C.A., Accounting.

A. R. Hunting, R.I.A., Accounting.

J. P. Masterson, C.A., R.I.A., Cost Accounting.

T. A. Newton, B.S., M.B.A., Business Principles.

K. E. Pye, R.I.A., Cost Accounting.

Guy Raymond, Ph.B., M.A., Industrial Psychology.

G. R. Stevens, Accident Prevention.

P. W. Trahair, C.A., Accounting.

T. G. Zuber, B.A., Barr.-at-Law, Industrial Legislation.

FACULTY OF ARTS AND SCIENCE

I. GENERAL INFORMATION

Course Programs

The Faculty of Arts and Science comprises the following course programs:

a) General Course in Arts leading to the B.A. degree.

b) General Course in Science leading to the B.Sc. degree.

c) Honours Courses in Arts leading to the B.A. degree.

d) Honours Courses in Science leading to the B.Sc. degree.

e) Certificate in Public Administration.

f) Honours Courses in Business Administration leading to the B.Comm. degree.

g) Certificate and Diploma Courses in Business Administration.

h) Degree Course in Nursing leading to the B.Sc.N. degree.

i) Diploma Courses in Nursing.

The Preliminary Year

This year is taken by all students who enter the University from Grade XII. The subjects chosen will depend upon whether the student intends to enter Arts, Science, Commerce, or Nursing (see p. 82).

The General Course

The General Course in Arts or Science requires three years' work beyond Grade XIII (Province of Ontario) or beyond Preliminary Year. This course is elected by the majority of students in the University. It provides a student with a broad background of liberal education, and at the same time allows for a field of concentration, called a major field. Majors are offered at the present time in the following fields:

In Arts: Economics, English, French, Geography, History, Home Economics, Latin, Mathematics, Philosophy, Political Science, Psychology, Religious Knowledge, Sociology, Spanish.

This program may be arranged to suit the needs of students planning to enter law, teaching, social work, personnel work, theology, or any profession requiring a good, general background in the Liberal Arts.

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In Science: Biology, Chemistry, Mathematics, Physics. This program may be arranged to suit the needs of students planning to enter teaching, industry, dentistry, medicine, pharmacy, or any profession requiring a background in Liberal Arts with emphasis upon the natural sciences and mathematics.

Honours Courses

Honours courses require four years of work beyond Grade XIII (Province of Ontario) or beyond Preliminary Year. They provide for a greater concentration in a given field of study than does the General Course, and demand a higher level of achievement. Through these courses, students are prepared for graduate study, research positions, high school teaching, and several other professions. At the present time Honours courses are offered in the following fields: Economics and Political Science; English Language and Literature; English and French; English and History; English and Philosophy (Philosophy option); English and Philosophy (Language option); English and Spanish; French and Spanish; History (Economics option); History (Philosophy option); Philosophy (Science option); Philosophy and Psychology; Psychology; Psychology and Science; Biology; Chemistry; Chemistry and Biology; Chemistry and Physics; Mathematics; Physics.

School of Business Administration

The course leading to the Bachelor of Commerce degree (B.Comm) requires four years beyond Grade XIII (Province of Ontario or beyond Preliminary Year. The School of Business Administration also offers a Diploma course in Management and a Certificate in Business Administration. (See page 114).

School of Nursing

The course leading to the Bachelor of Science in Nursing degree (B.Sc.N.) with majors in Nursing Education, Public Health Nursing and Nursing Service Administration, requires two full years of University work beyond Grade XIII (Province of Ontario) or beyond Preliminary Year, in addition to the three years normally required to obtain registration as a nurse in an approved Hospital School of Nursing. In addition to the degree program, the School of Nursing offers Diploma courses in the major areas listed above. (See page 117).

Extension Courses

For students who are unable to attend day classes during the winter session, the University offers courses in evening and

summer school. These courses have the some content and standards as those offered in the regular day classes of the winter session. No correspondence courses are offered by this University. For complete programs available through Extension courses see pages 280 ff.

Pre-professional Courses

Students intending to seek admission to graduate and professional schools should choose their options in accordance with the requirements for admission to these institutions.

a) **Teaching:**

Students intending to enter the teaching profession through the Ontario College of Education may qualify for the Ontario High School Assistants' Certificate either Type B or Type A.

1. **Type B.** The academic standing for admission to the course in the Ontario College of Education leading to a High School Assistants' Certificate, Type B, is a degree in Arts, Science, Commerce, Applied Science or Household Science from a British University, based upon courses approved by the Minister of Education.

A prospective High School teacher must include at least seven full subjects (twenty-one year credits) in High School teaching subjects in his undergraduate curriculum as required by the Ontario College of Education. It is further recommended that he major in a High School teaching subject to qualify for an endorsed certificate.

2. **Type A.** As a result of agreements between the Minister of Education and the University of Windsor, completion of the following Honours courses offered by this University with a final or graduation average of 66% fulfills the academic requirements for admission to the courses at the Ontario College of Education

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leading to High School Assistants' Certificates, Type A, in the fields as indicated below:

Honours Course	Type A Certificate
English Language and Literature	English
English and Philosophy (Language option)	English
English and History	English and History
English and French	English and French
English and Spanish	English and Spanish
French and Spanish	French and Spanish
History (Economics option	History
History (Philosophy option)	History
Chemistry and Biology	Chemistry and Biology
Chemistry and Physics	Physics and Chemistry
Mathematics	Mathematics
Physics	Mathematics and Physics

Graduates in General courses who wish to obtain Type A standing in English, English and History, History, Mathematics, Mathematics and Physics, Science, Physics and Chemistry, Physics and Biology, Chemistry and Biology should consult the Registrar.

b) Pre-medicine:

A student intending to apply for admission to a School of Medicine should take the pre-medical program as outlined under General B.Sc. program. The student is advised to study carefully the requirements of the particular Medical School to which he seeks admission, as there is some variation, both with respect to choice of subjects and number of years' study required for entrance. The student should consult the head of the Department of Biology early in his program with respect to his choice of subjects.

c) Pre-dentistry:

A student intending to qualify for admission to the First Dental Year at the University of Toronto should complete the program for First Year Science with the following courses: English 15, Chemistry 10, Physics 13, Zoology 10, Botany 10, French 12 or German 12 or Latin 12 or Philosophy 15 or Sociology 12.

d) Pre-medical Technology:

A student intending to enter a school of medical technology will follow the same program as biology majors.

e) Pre-optometry:

A student seeking to qualify for admission to optometry is advised to complete First Year Science with Physical Science option, substituting Zoology 10 and Psychology 15 for Chemistry 10 and R.K. C10 or 14 or a History.

f) Pre-pharmacy:

A student intending to qualify for admission to Second Year Pharmacy should complete the program for First Year Science with the following course program: English 15, Botany 10, Chemistry 10, Physics 13, Zoology 10, French 12 or Philosophy 15 or German 12 or Latin 12 or Political Science 12 or Sociology 12. (Students completing the program may transfer to Second Year Pharmacy at the University of Toronto, provided the requisite average has been attained.)

II. ACADEMIC REGULATIONS

Admission Requirements

1. General Admission Requirements:

Candidates seeking admission to any course in the Faculty of Arts and Science are subject to the General Admission Requirements for the University found on page 50.

2. Particular Admission Requirements:

For admission to First Year, an average of 60% on nine Grade XIII papers is recommended, and admission may be granted on this factor alone provided the proper subjects are chosen. The subjects required for admission to a particular program are shown along with the courses prescribed for that program.

Candidates seeking admission to a particular course program should consult the University Announcement in advance in order that they may assure themselves that they have chosen the proper subjects in Grade XIII (Province of Ontario) or in Preliminary Year to qualify for admission.

For admission to First Year from Ontario Grade XIII the requirements are as follows:

Arts: English (2 papers); another language (2 papers); and EITHER Mathematics (2 papers) or a third language (2 papers) and any other 3 papers; OR Music and any other 4 papers (or equivalent Preliminary Year, see p. 82).

Science: English (2 papers), another language (2 papers); Algebra, Geometry, Trigonometry, Chemistry and Physics; (60% average required in Mathematics and Science). Students majoring in the Physical Sciences must, in addition, have an average of 60% in Chemistry, Mathematics and Physics. (or equivalent Preliminary Year, see p. 83).

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Commerce (Business Administration): English (2 papers), another language (2 papers); Mathematics (2 papers); and any other 3 papers (or equivalent Preliminary Year, see p, 82).

Nursing (degree course): English (2 papers), another language (2 papers); Botany, Chemistry, Zoology; and any other 2 papers (or equivalent Preliminary Year, see p. 83).

The following certificates will be accepted in place of the one Grade XIII paper in Music: Grade IV Theory, OR Grade VII Practical and Grade II Theory.

In considering a candidate for admission, the Committee on Admissions will consider total evidence presented, e.g. examinations and grades, principal's recommendation, class standing, aptitude and ability tests, etc. A student lacking the full requirements (i.e. lacking one subject—two papers in one language, or any other two papers, or lacking the required average) may be admitted with "one condition," or "on probation." A student admitted **with a condition** must remove this condition before entering Second Year. A student admitted **on probation** will not be allowed to repeat his year in the event of failure of the year.

The Committee on Admissions may admit an applicant to First Year with eight papers, without conditions, provided that he has the necessary prerequisites for the program he wishes to enter, and has an average of 66% on the eight papers.

If an applicant has spent one or more years in Grade XIII and lacks more than one subject (as defined above), he may not be admitted to either the First Year or to the Preliminary Year, but must complete the entrance requirements for First Year by further high school work.

No student may enter University for the first time through the summer session, unless he has been out of school at least one year.

A student who has spent more than one year in Grade XIII will be expected to have nine papers (as above).

Registration

1. For regulations regarding application, see p. 52.

2. All applicants, when notified of their acceptance, are subject to the general regulations regarding registration (see page 52).

Examinations and Grading

All students are subject to the general regulations pertaining to examinations, see page 54.

The grading for individual subjects in General and Honours programs is as follows:

	In General Program	In Honours Program
75-100:	Grade A	I Class
66- 74:	Grade B	II Class
60- 65:	Grade C	III Class
50- 59:	Grade D	IV Class
40- 49:	Grade Fx	F
0- 39:	Grade F	F

At the regular Spring Examinations all grades below 50% are considered failures. If a student is permitted a supplemental examination, it is indicated by **Fx.**

Term Work

In all subjects, the ratio of term-work marks to examination marks is determined by the teaching staff of the Department; neither term mark nor examination mark, however, will count for less than one-third nor more than two-thirds of the final grade. To pass a subject, a student must obtain an average of 50% on term work and examination; his Faculty Council, however, may withhold credit of the mark in either term work or examination is below 50%.

Term work in a course will not be credited to a student beyond the year in which the course is taken.

Ranking of Students

In the **General Courses,** students are ranked in order of merit according to the average grade in all subjects prior to supplementals. The minimum for Grade A is 75% of the marks obtainable; for Grade B, 66%; for Grade C, 60%; for Grade D, the minimum passing grade, 50%.

In the **Honours Courses** in any department, students are ranked in order of merit in that department in four classes. Those who obtain 75%, or over, of the total number of marks will be placed in Class I; those who obtain 66% to 74% will be placed in Class II; those who obtain 60% to 65% will be placed in Class III; those who obtain between 50%, the minimum for pass, and 59%, will be placed

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in Class IV. The average of Honours students will be calculated as the general average of all courses in II Year, and the average of Honours subjects exclusively in III and IV Years.

Regulations for General Courses

Major: All students entering the General Course in Arts and Science must choose a major or field of concentration as outlined in the description of the course programs. In selecting his subjects in First Year, the student should include the subject appropriate to the major or Honours course he wishes to undertake. (History majors elect History 10. Students planning to enter Honours Business Administration elect Business Administration 15 and Economics 19. Mathematics majors take both Mathematics 11 and 15.)

The consent of the department concerned is required for choosing a particular major in arts or science.

Combined Major: A combined major (consisting of one subject per year in each of two fields) may be taken in the General Arts program, with the consent of the Dean and the departments concerned, provided that at least one of the subjects is chosen from Group A. The other may be chosen from Group A or B. At present, subjects are classified tentatively as follows:

Group A: Economics, English, French, Geography, History, Home Economics, Latin, Philosophy, Political Science, Psychology, Religious Knowledge, Sociology, Spanish.

Group B: Anthropology, Drama, Fine Arts, German.

Combined majors will be arranged to suit individual needs by the Dean in consultation with the heads of departments concerned.

Options: An "option" means a subject outside the major field (or fields, in the case of a combined major).

Options in Second and Third Years shall be chosen in consultation with the head of the department in which the student is majoring.

Options in each year of the General Arts program may be drawn from the natural sciences or mathematics, with permission of the Dean of Arts and Science.

Additional Subjects: Students in any year of any course program may be permitted to take an additional subject (additional to the prescribed program for that year) only with the written permission of the Dean of Arts and Science.

Reduced Programs: No full-time student in the General Course of Arts and Science will be permitted to take less than the prescribed program for his particular year unless for a sufficient reason he has been excused by the Dean. In no case will a full-time student be permitted to register in less than four full courses (see General Requirements, page 53).

Change of Registration: Once a student has registered, he may not change his course, or add or drop subjects without the written permission of the Dean. After obtaining such permission, the student must notify the Registrar's Office and the instructor(s) concerned of the change that has been approved before the change becomes effective (see General Regulations, page 54).

Any subject dropped without the permission of the Dean will be regarded as a failure.

Unless there are exceptional reasons, no student will be permitted to begin a new course later than the end of the second week of lectures in the course concerned.

Honours Subjects in the General Course: A student in the General Course may, with the consent of the Dean and the department concerned, substitute an Honours subject in place of a general course subject in his major field, provided he has the necessary prerequisites, and fulfills the conditions attaching to an Honours subject.

A student in the General Course who is taking an Honours subject and fails to obtain a passing grade therein, may be permitted to write a supplemental examination in the equivalent subject of the General Course and receive credit for the General Course subject.

Language Requirement: When a student begins a language other than English in the University, no credit towards a degree will be given for the first year of that language unless that year is followed by a second year in the same language, with the following exception: a student in the final year of a science major course who has Grade XIII credit in any language other than English may elect German A, French A or Russian A as a credit course for his humanities option, provided he has not taken that same language in Grade XIII.

No student may begin two languages, other than English, in the same year.

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Promotion and Graduation: For promotion from year to year in the General Course, a full-time student must fulfill the following conditions:

a) Obtain a general average of at least 50% in all subjects at the Spring Examinations;

b) Obtain a passing grade in at least four full courses at the Spring Examinations;

c) Not fail (below 50%) in more than two full courses (or the equivalent in half courses) at the Spring Examinations;

d) A repeating student must obtain passing grades in all his subjects at the Spring Examinations;

e) A student in Second Year must, in addition to the above conditions, obtain a Grade C (60%) or better in at least three full courses by the conclusion of the supplemental examinations.

Any student who does not fulfill the above conditions will be deemed to have failed his year and shall not be entitled to write supplementals but shall lose credit in all subjects of that year in which he has obtained less than 66%.

No student will be admitted to a Bachelor's degree who has not:

a) Obtained at least Grade D on all the prescribed and elective work of his course;

b) Obtained Grade C on half the work of the senior year;

c) Obtained an average of Grade C in all the courses in his major subject belonging to the Second and Third Years, exclusive of minor requirements.

(See also General Regulations re Graduation, page 57).

Failures: A student who has been granted the privilege of a supplemental examination, and fails to obtain 50% in it, will not be eligible for re-examination without a further year's attendance in the course in which he has failed. **The student must repeat that course, if it is prescribed, the year after failure, no matter what subject or subjects must be postponed.**

A course may be repeated once only.

A student who has failed his year is not permitted to write any supplemental or special examinations on the work of that year.

A student who is required to repeat his year's work will be allowed to retain credit in a subject in which he has obtained 66% or better and to substitute (with the Dean's approval) a subject at the same year-level and available without a clash of timetable.

A student who is repeating his year shall be required to obtain a passing grade in each individual subject of his approved registration at the following Spring Examination. If he fails to meet this requirement, he must withdraw.

Subjects which depend directly upon the work of a preceding year may not be taken by a student who has failed in the work of the preceding year.

A full-time student who fails his year and who has already failed a year (either here or elsewhere) must withdraw.

A student on probation who fails his year may not repeat the year, but must withdraw from the University.

Supplemental Examinations: Supplemental examinations are permitted to a student in subjects of the General Course in which he has obtained a Grade Fx (40%-49%), provided he has not failed his year.

No student will be allowed to write supplemental examinations in more than two full courses, or the equivalent in half-courses, in any one year.

In determining the final grade after a supplemental examination, the student's term mark in this subject will count for not less than 33% and not more than 66% of the final mark.

If a student, who has been granted permission to write a supplemental examination in a subject, either does not write, or fails to obtain 50% after the examination, he may not write further supplemental or special examinations in the course involved, but must repeat it in its entirety to obtain credit for it.

A student intending to write a supplemental examination must apply to the Registrar's Office by the date set by that office and pay the appropriate fee.

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Regulations for Honours Courses

Admission: For admission to the Second Year of any Honours program, a student must have completed First Year of the General Course program with the subjects and grades specified for the particular Honours program he desires to enter.

Promotion and Failure: For promotion from year to year in an Honours program, a student must obtain at least 60% average (III Class Honours), in the prescribed Honours subjects of the year and an overall average of at least 60%. A student who does not fulfill these requirements will not be permitted to continue in Honours but will be required to repeat his year or transfer to the General Course subject to the regulations set forth above for the General Course program.

The year average of Honours students will be calculated as the general average of all subjects in II Year, and the average of Honours subjects exclusively in III and IV Years.

A student who fails to obtain 50% in one Honours subject will be allowed to continue in Honours if his year average as calculated in the preceding paragraph is 60% or better.

No supplementals are allowed in Honours subjects. With regard to subjects of the General Course included in an Honours program, the regulations regarding supplementals for the General Course given above are applicable.

Comprehensive Examinations: In addition to the regular examinations, various departments have introduced comprehensive examinations for Honours students. These examinations, partly oral and partly written, are given at the end of the senior year and cover the broad aspects of the student's Honours course.

Transfer to General Course: If a student at the end of II Year Honours transfers to the General Course, he shall be required to take all subjects of III Year General.

If a student in III Year Honours transfers to the General Course he will not be eligible for a degree unless he has completed all the required subjects of the General Course.

A student in Fourth Year of an Honours Course, who, at the final examinations, fails to obtain the average of 60%, will not be admitted to an Honours degree but may, on the recommendation of the Committee on Academic Standing, be awarded a degree in the General Course provided he has obtained 50% in each course of his final year. The candidate may write subsequent examinations for the Honours degree.

Graduation: For regulations pertaining to graduation, prospective graduates are referred to General Regulations, page 57.

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THE PRELIMINARY YEAR

Admission Requirements

Completion in not more than 4 years beyond Grade VIII of the work required for the Ontario Secondary School Graduation Diploma in the General Course, or an equivalent certificate, with an average of at least 65% in the following subjects of Grade XII:

1. English and History.
2. Latin or Mathematics.
3. One of: Latin, French, German, Spanish, Italian, Greek.
4. Two of: Mathematics, Science or Agriculture, Music, Geography, option from (3) not previously used.

No option may be counted more than once. For the Music option the following certificates will be accepted: Grade III Theory, OR Grade VII Practical and Grade II Theory.

Applicants for the B.Comm. program must have completed courses in Intermediate Algebra and Plane Geometry. Applicants for the B.Sc. programs must have completed courses in Intermediate Algebra, Plane Geometry, Physics and Chemistry (or Agriculture): an average of 66% in these subjects is required of prospective engineers and of those intending to major in chemistry, mathematics or physics.

An applicant who has completed advanced High School work outside of Ontario should submit the Departmental or other official certificates (originals or photostatic copies) to the Committee on Admissions for a decision regarding eligibility for entrance.

Course Programs for Preliminary Year

(a) Arts and Commerce

1. English 5, Library Science
2. Language A or 2
3. Mathematics 4ab (or Mathematics 1y, 2y, 3y*)
   or Music or Language A or 2
4. One of: Biology 1, Geography 10, Geology 10, Home Economics 10, Chemistry 1, Physics 1.
5. One of: Language A or 2+, History 4, or, a second Science from (4)

* — For those desiring to major in Mathematics in the B.A. program.

\+ — No more than one language may be begun the same year and no more than two languages, other than English, included in the Preliminary Year.

This prepares for admission to First Year Arts, leading to General and Honours B.A. degrees; and to the Honours B.Comm. degree provided Mathematics has been completed. (Students planning to enter Honours Philosophy (Science options) or Honours Psychology and Science should take Preliminary Year Science (see below).

(b) **Science**

1. English 5, Library Science
2. Language A or 2
3. Mathematics 1y, 2y, 3y*
4. Physics 1
5. Chemistry 1

* — Students intending to enter the **General Course** with Biology as a major may substitute Biology 1 for Mathematics 3y.

This prepares for admission to First Year Arts (including pre-Commerce), Science (leading to General and Honours B.Sc. degrees), and Engineering (leading to the B.A.Sc. degree).

(c) **Nursing**

1. English 5, Library Science
2. Language A or 2
3. Biology 1
4. Chemistry 1
5. Nursing 1a
6. One of: Sociology 12, Home Economics 10, History 4, another Language A or 2.

This prepares for admission to First Year Nursing (leading to the B.Sc.N. degree).

For conditions for promotion to First Year, see "Requirements for Admission to First Year," pages 50 and 73.

N.B.: Students of the Preliminary Year who successfully complete Library Science are not required to repeat this subject in First Year.

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BACHELOR OF ARTS

GENERAL COURSE

Admission requirements: Nine Grade XIII papers, including English (2 papers); another language (2 papers); and either Mathematics (2 papers) or a third language (2 papers) and any other 3 papers, or Music and any other 4 papers; or Preliminary Year (see p. 82). (A student wishing to major in Mathematics must have included Algebra, Geometry, Trigonometry among his Grade XIII papers, or Mathematics 1y, 2y, 3y in the Preliminary Year).

FIRST YEAR

English 15, Library Science
Language †2 or 12, or 4**
R.K. C10 or 14 or option
Philosophy 15

Two courses from: ‡ (see also p. 76)

Anthropology 10; Economics 15 or 19; Geography 10; History 10 or 11; Math 11; Math 15; Psychology 15; Sociology 12; Business Administration 15, or Home Economics 10, or Political Science 12, or an additional language †2 or 12, or option.

SECOND YEAR

R.K. C20 or 24 or Philosophy 22
Philosophy 25

Two options ‡

Two courses in one of the following major fields:

Economics:	21, 23
English:	22 and one other
French:	22y, 23y, 27
Geography:	19, 24
History:	36, and 22 or 27
Home Economics:	25, 27
Latin:	21, 22
Mathematics:	25, and 32 or 37
Philosophy:	24 or 27 or 31, and one other
Political Science:	20 and one other
Psychology:	2 full courses from: 22, 26a, 26b, 28, 31, 33a, 34
Religious Knowledge:	22, *24
Sociology:	2 of: 23, 25ab, 29
Sociology-Anthropology:	Anthrop. 28; and Sociology 25 ab or 29
Spanish:	†12 or 25, and 22y, 23y

THIRD YEAR

R.K. 34 or C 36 or option

Two options ‡

Two courses in one of the following major fields:

Economics:	Two courses
English:	39 and one other
French:	31, 37
Geography:	34 and one other
History:	Two courses
Home Economics:	31, 37, seminar
Latin:	31, 32
Mathematics:	32 or 37, and 22 or non-major option
Philosophy:	34, and 24 or 27 or 31
Political Science:	Two courses
Psychology:	2 full courses from: 22, 26a, 26b, 28, 31, 33a, 34
Religious Knowledge:	33, *34
Sociology:	2 of: 35, 37, Psychology 34
Sociology-Anthropology:	Sociology 35 and 37
Spanish:	25, 34, 36

†Omit, if previously taken.

*If already chosen, an option is to be substituted.

**A student who has not had Spanish and wishes to take the Honours Language program, should take Spanish 4 (which is elementary and intermediate combined).

‡Every course program must include a sequence of at least two courses in one of Economics, Political Science, Sociology, History, Anthropology or Psychology. If the student has selected one of these subjects as his major, the requirements under this rule have been fulfilled.

Note: 1. Not more than one course from those numbered A and 1 - 9 may be credited beyond Preliminary Year.

2. At least eight of the eleven courses required in the final two years must be chosen from courses numbered 20 or above.

3. A maximum of two courses in Business Administration may be credited towards a B.A. Degree.

I. HONOURS ECONOMICS AND POLITICAL SCIENCE

Admission requirements: Nine Grade XIII papers, including English (2 papers); another language (2 papers); and either Mathematics (2 papers) or a third language (2 papers) and any other 3 papers, or Music and any other 4 papers; or equivalent subjects of Preliminary Year (see p. 82).

First Year General

	Hrs./wk.
English 15, Library Science	3
Language 12 (or 2)	3
Religious Knowledge C10 or 14 or option	2
Philosophy 15	3
Economics 19‡	3
Political Science 12 or option	3
	17

For admission to Second Year Honours, an overall average of 60% is required, and at least 66% in Economics 19 or Economics 15.‡

Second Year Honours

Philosophy 25	3
Math. 23; or Bus. Ad. 15b + ½ course option	2
Economics 221 (Pricing Theory and Policy)	3
Economics 223 (Money, Banking, National Income)	3
Economics 237 (Economic History of Europe and U.S.)	3
Political Science 220 (Canadian Government)	3
	17

Third Year Honours

Religious Knowledge 34, or C36, or Philosophy 22	2
One of: English 22, 36, 38, or Option	3
Economics 334 (Statistical Methods)	2 (+ 2 lab)
Economics 338 (Econ. Hist. and Problems of Canada)	3
One of: Economics 301 (International Economics)	3
Economics 331 (Public Finance)	
Economics 336 (Economics of Labour)	
A Fourth Year course in Economics selected in consultation with the Department.	
One of: Political Science 331 (Comparative Govt.)	3
Political Science 334 (Commonwealth of Nations)	
	16 (+ 2 lab)

Fourth Year Honours

History 36	3
Economics 400 (History of Economic Thought)	2
Political Science 452 (History of Political Thought)	2
Three of: Economics 402 (Govt. and Econ. Life)	2
Economics 406 (Bus. Cycles: Econ. Development)	2
Economics 410 (Modern Economic Theory)	2
Any Third Year course in Economics not previously taken.	3
Pol. Sc. 432a and Econ. 432b (Soviet Govt. & Economy)	2
Pol. Sc. 443 (International Politics)	2
	13 or 14

‡Students who have taken Economics 15 may be accepted into Second Year Honours with permission of the Head of the Department.

II. HONOURS ENGLISH LANGUAGE AND LITERATURE

Admission requirements: Nine Grade XIII papers, including English (2 papers); French (2 papers); either Mathematics (2 papers) or another language (2 papers) and any other 3 papers, or Music and any other 4 papers; or equivalent subjects of Preliminary Year (see p. 82).

This program is accepted by the Ontario Department of Education as academic qualification for the High School Assistant's Certificate, Type A, English.

First Year General

	Hrs./wk.
English 15, Library Science	3
French 12	3
Philosophy 15	3
Religious Knowledge C10 or 14 or option	2
History 10	3
One of: Economics 15 or 19, or Psychology 15	3
	17

For admission to Second Year Honours. an overall average of at least 60% is required, with at least 66% in English 15, French 12, and History 10.

Second Year Honours

R. K. C20 or 24 or Philosophy 22	2
Philosophy 25	3
French 27 or option	3
English 212y (Greek Lit. in English translation)	1
English 236 (Modern British and American Drama)	3
English 250 (Restoration and 18th Century Literature)	2
English 254 (Criticism, Scholarship, Bibliography)	2
	16

Third Year Honours

R. K. 34 or C36 or option	2
Option	3
English 350 (Romantic Revival)	3
English 356 (English Drama to 1642)	3
English 358 (American and Canadian Literature)	3
English 363 (Old and Middle English)	3
	17

Fourth Year Honours

Option	3
English 447 (History of the English Language)	2
English 450 (Renaissance Lit., Non-Dramatic)	3
English 459 (Recent Literature in English)	3
English 460 (Victorian Period)	3
English 463 (Advanced Middle English)	2
	16

III. HONOURS ENGLISH AND FRENCH

Admission requirements: Nine Grade XIII papers, including English (2 papers); French (2 papers); and either Mathematics (2 papers) or another language (2 papers) and any other 3 papers, or Music and any other 4 papers or equivalent subjects of Preliminary Year (see p. 82).

This program is accepted by the Ontario Department of Education as academic qualification for the High School Assistant's Certificate, Type A, English and French.

First Year General

	Hrs./wk.
English 15, Library Science	3
French 12	3
History 10	3
Religious Knowledge C10 or 14 or option	2
Philosophy 15	3
Latin or another Language	3
	17

For admission to Second Year Honours, an overall average of at least 60% is required, and at least 66% in English and French.

Second Year Honours

Philosophy 25	3
English 250 (Restoration and 18th Century Literature)	2
English 254 (Criticism, Scholarship, Bibliography)	2
One of: English 236 (Modern British and American Drama)	3
English 358 (American and Canadian Literature)	(3)
French 260y (Prose Composition)	1
French 261y (Conversation, Phonetics)	2
French 270 (Renaissance and Classical Literature)	3
	16

Third Year Honours

R. K. 34 or C 36 or Philosophy 22	2
History 36	3
One of: English 350 (Romantic Revival)	3
English 356 (English Drama to 1642)	(3)
English 363 (Old and Middle English)	3
French 375y (Advanced Prose Composition)	1
French 376y (French Canadian Lit.: Criticism)	1
French 380 (Literature of the 18th Century)	3
	16

Fourth Year Honours

English 450 (Renaissance Lit., Non-Dramatic)	3
English 460 (Victorian Period)	3
English 463 (Advanced Middle English)	3
French 490 (Literature of 19th Century)	3
French 495 (Literature of 20th Century)	3
French 496y (Old French)	1
	16

IV. HONOURS ENGLISH AND HISTORY

Admission requirements: Nine Grade XIII papers, including English (2 papers); another language (2 papers); and either Mathematics (2 papers) or another language (2 papers) and any other 3 papers, or Music and any other 4 papers; or equivalent subjects of Preliminary Year (see p. 82).

This program is accepted by the Ontario Department of Education as academic qualification for the High School Assistant's Certificate, Type A, English and History.

First Year General

	Hrs./wk.
English 15, Library Science	3
Language 12 (or 2)	3
Religious Knowledge C10 or 14 or option	2
Philosophy 15	3
History 10	3
One of: Economics 15 or 19 or Psychology 15	3
	17

For admission to Second Year Honours, an overall average of at least 60% is required, and 66% in English, Language and History.

Second Year Honours

R.K. C20 or 24 or Philosophy 22	3
Philosophy 25	3
English 250 (Restoration and 18th Century)	2
English 254 (Criticism, Scholarship, Bibliography)	2
One of: English 236 (Modern British and American Drama)	3
English 358 (American and Canadian Literature)	(3)
History 236 (Modern History)	3
History 257 (Ancient Civilizations) or 222 (Canada)	3
	18

Third Year Honours

Political Science 12 or Geography 10	3
English 350 (Romantic Revival)	3
English 356 (English Drama to 1642)	3
English 363 (Old and Middle English)	3
Three of: History 324 (History of England)	9
History 332 (British North America 1815 - 1867)	
or 330 (The Canadian Political Tradition)	
History 333 (British Commonwealth)	
History 334 (United States)	
History 335 (Latin America)	
History 337 (Russia)	
	21

Fourth Year Honours

Three of: English 450 (Renaissance Lit., Non-Dramatic)	9
English 459 (Recent Lit. in English)	
English 460 (Victorian Period)	
English 463 (Advanced Middle English)	
Three of: History 438 (Diplomatic History of the U.S.)	9
History 439 (History of U.S.S.R.)	
History 452 (European Society & Institutions)	
History 458 (Canada - Autonomous State)	
History 461 (Canadian-American Relations)	
	18

V. HONOURS ENGLISH AND PHILOSOPHY
(Philosophy Option)

Admission requirements: Nine Grade XIII papers, including English (2 papers); another language (2 papers); and either Mathematics (2 papers) or another language (2 papers) and any other 3 papers, or Music and any other 4 papers; or equivalent subjects of Preliminary Year (see p. 82).

First Year General

	Hrs./wk.
English 15, Library Science	3
Language 12 (or 2)	3
Religious Knowledge C10 or 14 or option	2
Philosophy 15	3
Psychology 15	3
One of: Economics 15 or 19 or History 10	3
	17

For admission to Second Year Honours, an overall average of at least 60% is required, and 66% in English 15, Language 12 and Philosophy 15.

Second Year Honours

Philosophy 25	3
Philosophy 224 (Greek Philosophy)	3
Pholosophy 228 (Philosophical Psychology)	3
English 212y (Greek Lit. in English Translation)	1
English 250 (Restoration and 18th Century Lit.)	2
English 254 (Criticism, Scholarship, Bibliography)	2
One of: English 236 (Modern British and American Literature)	3
English 358 (American and Canadian Literature)	(3)
	16

Third Year Honours

R.K. C20 or 24 or option	2
Philosophy 327 (History of Medieval Philosophy)	3
Philosophy 334 (Metaphysics)	3
English 350 (Romantic Revival)	3
English 356 (English Drama to 1642)	3
English 363 (Old and Middle English)	3
	17

Fourth Year Honours

Philosophy 336a (Existentialism)	(1st sem)	3
Philosophy 439 (Law and Politics)		2
Philosophy 432b (Philosophy of Art)	(2nd sem)	3
Philosophy 431 (Modern & Contemporary)		2
English 450 (Renaissance Lit., Non-Dramatic)		3
English 459 (Recent Literature in English)		3
English 460 (Victorian Period)		3
		16

VI. HONOURS ENGLISH AND PHILOSOPHY
(Language Option)

Admission requirements: Nine Grade XIII papers, including English (2 papers); French (2 papers) or Latin (2 papers); and either Mathematics (2 papers) or another language (2 papers) and any other 3 papers, or Music and any other 4 papers; or equivalent subjects of Preliminary Year (see p. 82).

This program is accepted by the Ontario Department of Education as academic qualification for the High School Assistant's Certificate, Type A, English.

First Year General

	Hrs./wk.
English 15, Library Science	3
French 12	3
Religious Knowledge C10 or 14 or option	2
Philosophy 15	3
Psychology 15	3
One of: Economics 15 or 19 or History 10	3
	17

For admission to Second Year Honours, an overall average of at least 60% is required, and 66% in English 15, French 12, and Philosophy 15.

Second Year Honours

Philosophy 25	3	
Philosophy 224 (Greek Philosophy)	3	
English 250 (Restoration and 18th Century Lit.)	2	
English 254 (Criticism, Scholarship, Bibliography)	2	
One of: English 236 (Modern British and American Drama)	3	
English 358 (American and Canadian Literature)	(3)	
Either: French 260y (Prose Composition)	1	
French 261y (Conversation, Phonetics)	1	+ Lab
French 270 (Renaissance and Classical Literature)	3	
or Latin 222 (Lyric Poetry)	3	
Latin 331 (Roman Satire)	3	
	18 or 19	

Third Year Honours

English 350 (Romantic Revival)	3
English 356 (English Drama to 1642)	3
English 363 (Old and Middle English)	3
Philosophy 334 (Metaphysics)	3
Philosophy 431 (Modern and Contemporary Philosophy)	3
One of: French 380 (18th Century Literature)	3
Latin 332 (Roman Comedy)	
	18

Fourth Year Honours

Three of: English 450 (Renaissance Lit., Non-Dramatic)		3
English 459 (Recent Literature in English)		3
English 460 (Victorian Period)		3
English 463 (Advanced Middle English)		(3)
Philosophy 226b (Philosophy of Education)	(2nd sem)	3
Philosophy 336a (Existentialism)	(1st sem)	3
One of: French 490 (19th Century Literatiure)		3
French 495 (20th Century Literature)		(3)
Latin 450 (Virgil's Bucolics & Georgics)		
		15

VII. HONOURS ENGLISH AND SPANISH

Admission requirements: Nine Grade XIII papers, including English (2 papers); another language (2 papers); and either Mathematics (2 papers) or another language (2 papers) and any other 3 papers, or Music and any other 4 papers; or equivalent subjects of Preliminary Year (see p. 82).

This program is accepted by the Ontario Department of Education as academic qualification for the High School Assistant's Certificate, Type A, English and Spanish.

First Year General

	Hrs./wk.
English 15, Library Science	3
Spanish 12 (or 4)	3(5)
History 10	3
R.K. C10 or 14 or option	2
Philosophy 15	3
Latin or another Language	3
	17(19)

For admission to Second Year Honours, an overall average of at least 60% is required, and at least 66% in English and Spanish.

Second Year Honours

R.K. C20 or 24 or Philosophy 22	2
Philosophy 25	3
English 250 (Restoration and 18th Century Literature)	2
English 254 (Criticism, Scholarship, Bibliography)	2
One of: English 236 (Modern British and American Drama)	3
English 358 (American and Canadian Literature)	(3)
Spanish 222y (Conversation)	1
Spanish 223y (Advanced Composition)	1
Spanish 225 (Spanish Theatre)	4
	18

Third Year Honours

History 35	3
Option (or Spanish 221)	3
English 363 (Old and Middle English Language and Lit.)	3
One of: English 350 (Romantic Revival)	3
English 356 (English Drama to 1642)	(3)
Spanish 333 (Mexican Literature)	2
Spanish 334 (Spanish American Literature)	2
Spanish 338y (Romance Philology)	1
	17

Fourth Year Honours

English 450 (Renaissance Lit., Non-Dramatic)	3
English 460 (Victorian Period)	3
English 463 (Advanced Middle English)	3
Spanish 436 (Great Masterpieces)	2
Spanish 437 (Great Masterpieces)	2
Spanish 438y (History of the Spanish Language)	1
	14

VIII. HONOURS FRENCH AND SPANISH

Admission requirements: Nine Grade XIII papers, including English (2 papers; French (2 papers); and either Mathematics (2 papers) or another language (2 papers) and any other 3 papers, or Music and any other 4 papers; or equivalent subjects of Preliminary Year (see p. 82).

This program is accepted by the Ontario Department of Education as academic qualification for the High School Assistant's Certificate, Type A, French and Spanish.

First Year General

	Hrs./wk.
English 15, Library Science	3
French 12	3
Spanish 12 (or 4)	3(5)
History 10	3
Religious Knowledge C10 or 14 or option	2
Philosophy 15	3
	17(19)

For admission to Second Year Honours, an overall average of at least 60% is required, and at least 66% in French and Spanish.

Second Year Honours

History 35	3
R.K. C20 or 24 or option	2
French 260y (Prose Composition)	1
French 261y (Conversation, phonetics)	2
French 270 (Renaissance and Classical Literature)	3
Spanish 222y (Conversation)	1
Spanish 223y (Advanced Composition)	1
Spanish 225 (Spanish Theatre) or 12	4
	17

Third Year Honours

Philosophy 25	3
Option (or Spanish 221)	3
French 375y (Advanced Prose Composition)	1
French 376y (French Canadian Lit.: Criticism)	1
French 380 (18th Century Literature)	3
Spanish 333 (Mexican Literature)	2
Spanish 334 (Spanish American Literature)	2
Spanish 338y (Romance Philology)	1
	16

Fourth Year Honours

History 36	3
French 490 (19th Century Literature)	3
French 495 ((20th Century Literature)	3
French 496y (Old French)	1
Spanish 436 (Great Masterpieces)	2
Spanish 437 (Great Masterpieces)	2
Spanish 438y (History of the Spanish Language)	1
	15

IX. HONOURS HISTORY (Economics Option)

Admission requirements: Nine Grade XIII papers, including English (2 papers); another language (2 papers); and either Mathematics (2 papers) or another language (2 papers) and any other 3 papers, or Music and any other 4 papers; or equivalent subjects of Preliminary Year (see p. 82).

This program is accepted by the Ontario Department of Education as academic qualification for the High School Assistant's Certificate, Type A, History.

First Year General

	Hrs./wk.
English 15, Library Science	3
Language 12 (or 2)	3
Religious Knowledge C10 or 14 or option	2
Philosophy 15	3
History 10	3
Economics 19‡	3
	17

For admission to Second Year Honours, an overall average of at least 60% is required, with at least 66% in English 15, History 10, and Economics 19.

Second Year Honours

Philosophy 25	3
Geography 10	3
Geography 219 (World Resources and Industries)	3
Economics 223 (Money, Banking, National Income)	3
History 236 (Modern History)	3
History 257 (Ancient Civilizations) or 222 (Canada)	3
	18

Third Year Honours

R.K. C20 or 24 or Philosophy 22	2
Geography 324 (World Regional Geography)	3
Economics 338 (Econ. History and Policies of Canada)	3
Three of: History 330 or 332; 324; 333; 334; 335; 337	9
	17

Fourth Year Honours

Geography 334 (Canada)	3
One of: Economics 400 (History of Economic Thought)	2
Pol. Sc. 452 (History of Political Thought)	2
Three of: History 425, 438, 439, 452, 455, 458, 461	9
One of: Economics 402 (Government and Economic Life)	2
Economics 432b & Pol. Sc. 432a (Soviet Economy and Govt.)	(2)
Pol. Sc. 334 (Commonwealth of Nations)	(2)
	16

‡Students who have taken Economics 15 may be accepted into Second Year Honours at the discretion of the Department.

X. HONOURS HISTORY (Philosophy Option)

Admission requirements: Nine Grade XIII papers, including English (2 papers); another language (2 papers); and either Mathematics (2 papers) or another language (2 papers) and any other 3 papers, or Music and any other 4 papers; or equivalent subjects of Preliminary Year (see p. 82).

This program is accepted by the Ontario Department of Education as academic qualification for the High School Assistant's Certificate, Type A, History.

First Year General

	Hrs./wk.
English 15, Library Science	3
Language 12 (or 2)	3
Religious Knowledge C10 or 14 or option	2
Philosophy 15	3
History 10	3
Psychology 15	3
	17

For admission to Second Year Honours, an overall average of at least 60% is required, with at least 66% in English 15, Philosophy 15 and History 10.

Second Year Honours

Philosophy 25		3
Geography 10		3
Philosophy 224 (Greek Philosophy)		3
Philosophy 226b (Philosophy of Education)	(2nd sem)	3
Philosophy 336a (Existentialism)	(1st sem)	3
History 236 (Modern History)		3
History 257 (Ancient Civilizations) or 222 (Canada)		3
		18

Third Year Honours

R.K. C20 or 24 or option	2
Geography 324 (World Regional Geography)	3
Philosophy 327 (History of Medieval Philosophy)	3
Philosophy 334 (Metaphysics)	3
Three of: History 330 or 332; 324; 333; 334; 335; 337	9
	20

Fourth Year Honours

Option	3
Pol. Sc. 212 (Elements of Political Science)	3
Philosophy 431 (Modern and Contemporary)	3
History 438 (Diplomatic History of the U.S.)	3
One of: History 425, 439, 452, 455, 458, 461	3
	15

XI. HONOURS MATHEMATICS

Admission requirements: Nine Grade XIII papers, including English (2 papers); another language (2 papers); Algebra, Geometry and Trigonometry; Physics; and one other paper; or equivalent subjects of Preliminary Year (see p. 82).

This course includes the required number of Mathematics courses for Type A certification.

First Year General

	Hrs./wk. Lect.	Tut.
English 15, Library Science	3	
R. K. C10 or 14 or option	2	
Language 2 or 12	3	
Philosophy 15	3	
Mathematics 11	2	2
Mathematics 15	3	
	17	2

For admission to Second Year, the student must obtain an average of 66% in Mathematics 11 and 15, and an overall average of 60%.

Second Year Honours

Philosophy 25	3	
Mathematics 227	3	1
Mathematics 229	3	1
Mathematics 254a, 254b	4	1
2 options (science or humanity)	6	3 or 6
	19	6 or 9

Third Year Honours

R. K. 34 or C36 or Philosophy 22	2
Mathematics 300	3
Mathematics 331	3
Mathematics 338a	1½
Mathematics 341a	1½
Mathematics 354	3
1½ options (science or humanity)	3½ to 4½
	17½ to 18½

Fourth Year Honours

Six and a half courses including at least 5½ courses in Mathematics chosen from courses numbered 400 or higher. The usual choice would be:
Mathematics 400, 429b, 435y, 437, 444, 448 and 449a.

Note: 1. Among the options, a sequence of 3 subjects must be chosen to constitute a minor.

2. Students wishing to take Mathematics 449b, 450a, 450b, 451 or 453 in their fourth year should choose Mathematics 341b as a third year option. They should also include sufficient Physics courses among their options to prepare for the desired course.

XII. HONOURS PHILOSOPHY (Science Option)

Admission requirements: Nine Grade XIII papers, including English (2 papers); another language (2 papers); Mathematics (2 papers); Physics and Chemistry; or the equivalent subjects of Preliminary Year (see p. 82), with at least 60% overall average.

First Year General

	Hrs./wk. Lect.	Lab.	Tut.
English 15, Library Science	3		
Religious Knowledge C10 or 14 or option	2		
Language 12 (or 2)	3		
Philosophy 15	3		
One group of: (i) Botany 10, Zoology 10	4	6	
(ii) Chemistry 10, Mathematics 15	6	3	
(iii) Mathematics 15, Physics 10	6	3	

Total hours per week: (i) 15/6 (ii) 17/3 (iii) 17/3

For admission to Second Year Honours, the student must obtain at least 60% in the science options and in Philosophy, and an overall average of at least 60%.

Second Year Honours

Philosophy 25	3		
English or another language	3		
One group of: (i) Psychology 15, Zoology 22	6	3	
(ii) Psychology 15, Chemistry 22	5	3	
(iii) Mathematics 11, 25ax, 25 bx	6		2
Philosophy 222 (Ethics)	2		
Philosophy 221a, 226b (Logic, Philosophy of Education)	3		
Philosophy 333b (Phenomenology)	1½		

Total hours per week: (i) 17½/3 (ii) 17½/3 (iii) 18½/2

Third Year Honours

Religious Knowledge 34 or C36 or option	2		
One group of: (i) Botany 24, Zoology 34a	3	4½	
(ii) Chemistry 23, Chemistry 24	4	3	
(iii) Physics 22, 23	6	6	
Philosophy 327 (History of Medieval Philosophy)	3		
Philosophy 334 (Metaphysics)	3		
Philosophy 336 (Existentialism)	2		

Total hours per week: (i) 15/4½ (ii) 14/3 (iii) 16/6

Fourth Year Honours

Option	3		
One group of: (i) Biology 337y, Biology 442b	3½		
(ii) Chemistry 34	2	3	
(iii) Physics 36, Psychology 15	5	3	
Philosophy 411 (Philosophy of the Sciences)	3		
Pholosophy 431 (Modern and Contemporary Philosophy)	3		
Philosophy 435 (Analysis, Symbolic Logic)	3		

Total hours per week: (i) 15½ (ii) 14/3 (iii) 17/3

XIII. HONOURS PHILOSOPHY AND PSYCHOLOGY

Admission requirements: Nine Grade XIII papers, including English (2 papers); another language (2 papers); and either Mathematics (2 papers) or another language (2 papers) and any other 3 papers, or Music and any other 4 papers; or equivalent subjects of Preliminary Year (see p. 82).

First Year General

	Hrs./wk.
English 15, Library Science	3
Language 12 (or 2)	3
Religious Knowledge C10 or 14 or option	2
Philosophy 15	3
One of: Economics 15 or 19 or History 10	3
Psychology 15	3
	17

For admission to Second Year Honours, an overall average of at least 60% is required.

Second Year Honours

Two of: Philosophy 25*, Economics 15* or 19, History* option	6
Philosophy 228 (Philosophical Psychology)	3
Philosophy 224 (Greek Philosophy)	3
Psychology 228 (Statistical Methods)	3
Psychology 231 (Abnormal)	3
	18

Third Year Honours

R.K. C20 or 24 or option	2
Pol. Sc. 212	3
Philosophy 327 (Medieval Philosophy)	3
Philosophy 334 (Metaphysics)	3
Psychology 230 (Experimental Psychology)	2 (+ 2 lab.)
Psychology 429 (Personality)	3
	16/2

Fourth Year Honours

R.K. 34 or C36 or option	2
Option	3
Any two full Honours courses in Philosophy as approved by the Department	6
Any two full Honours courses in Psychology as approved by the Department	6
	17

*Required unless previously taken.

XIV. HONOURS PSYCHOLOGY

Admission requirements: Nine Grade XIII papers, including English (2 papers); another language (2 papers); and either Mathematics (2 papers) or another language (2 papers) and any other 3 papers, or Music and any other 4 papers or equivalent subjects of Preliminary Year (see p. 82).

First Year General

	Hrs./wk.
English 15, Library Science	3
Language 12 (or 2)	3
Religious Knowledge C10 or 14 or option	2
Philosophy 15	3
One of: Economics 15 or 19 or History 10	3
Psychology 15	3
	17

For admission to Second Year Honours, an overall average of at least 60% is required, and 66% in Psychology 15.

Second Year Honours

R.K. C20 or 24 or Philosophy 22	2	
Philosophy 25	3	
Psychology 222 (Child and Adolescent Psychology)	3	
Psychology 228 (Statistical Methods)	3	
Psychology 230 (Experimental Psychology)	2	(+ 2 lab.)
Psychology 231 (Abnormal)	3	
	16/2	

Third Year Honours

Option		3	
R.K. 34 or C36 or option		2	
Pyschology 326a (Educational Psychology)	(1st sem.)	3	
Psychology 327 (Tests and Measurements)		3	
Psychology 333b (Physiological Psychology)	(2nd sem.)	3	
Psychology 334 (Social Psychology)		3	
Psychology 353 (Learning)		2	(+ 2 lab.)
		16/2	

Fourth Year Honours

Two Options	6
Psychology 429 (Personality)	3
Psychology 450 (Projective Techniques)	3
Psychology 451 (Advanced Statistics)	3
One of: Psychology 452 (Emotions)	
Psychology 454 (Industrial)	3
Total hours per week:	18

Note: Options are to be approved by the Department; it is recommended that at least one be in Biology and one in Physics.

XV. HONOURS PSYCHOLOGY AND SCIENCE

Admission requirements: Grade XIII: English (2 papers); Language (2 papers); Algebra, Geometry, Trigonometry, Physics; and one other paper; with an average of at least 60% in Mathematics and Physics; or the equivalent subjects of Preliminary Year Science (see p. 82).

First Year General

	Hrs./wk. Lect.	Lab.	
English 15, Library Science	3		
Philosophy 15	3		
Religious Knowledge C10, or 14, or a History	2		
Psychology 15	3		
Physics 10	3	3	
Mathematics 11	2	2	
Mathematics 15	3		
	19	5	

For admission to Second Year Honours, the student must obtain at least 66% in each of Psychology, Mathematics and Physics of First Year, and an overall average of at least 60%.

Second Year Honours

Philosophy 25	3		
Psychology 228 (Statistical Methods)	3		
Psychology 231 (Abnormal)	3		
Mathematics 25ab (Calculus)	4	2	Tutorial
Physics 222 (Optics)	3	3	
Biology 1	2	2	
	18	7	

Third Year Honours

Religious Knowledge 34, or C36, or Philosophy 22	2		
Option (Humanities)	2		
Psychology 230 (Experimental)	2	2	
Psychology 334 (Social)	3		
Mathematics 33ab (Adv. Calculus)	4	2/3	
Physics 223 (Electricity, Magnetism)	3	3	
	16	7/8	

Fourth Year Honours

Option (Humanities)	2		
Psychology 333b (half course) (Physiological)	3		
Psychology 353 (Learning)	3		
Psychology 451 (Advanced Statistics)	3		
Mathematics 227 (Intro. to Modern Algebra)	3	1	Tutorial
Physics 334 (Electronics)	2		
Physics 370/1 (Junior Physics Lab)		2	
Biology 29y (Genetics)	2		
	15/18	3	

BACHELOR OF SCIENCE

GENERAL COURSE

Admission requirements: English (2 papers); another language (2 papers); Algebra, Geometery, Trigonometry, Chemistry and Physics with an overall average of 60%; or Preliminary Year Science (see p. 83). Students majoring in the Physical Sciences, in addition, must have an average of 60% in Chemistry, Mathematics and Physics. (Applicants intending to major in Biology in the General course may be admitted with another Grade XIII paper in place of the third Mathematics paper).

FIRST YEAR

English 15, Library Science
Philosophy 15
Religious Knowledge C10 or 14 or option
Chemistry 10
and one of the following groups:

Biological Science Option (Biochemistry, Biology and Pre-medicine)
Botany 10, Zoology 10

Physical Science Option (Chemistry, Mathematics, Physics)
Mathematics 15, Physics 10

Students intending to take the Honours course in Chemistry, Chemistry and Physics, Mathematics and Physics (Mathematics Division), Mathematics and Physics (Physics Division) will add to this program Mathematics 11.

SECOND YEAR

Religious Knowledge C20 or 24 or Philosophy 22
Philosophy 25
and one of the following major groups:

Biology, Pre-medicine: Chemistry 23, Physics 13, Zoology 22; Chemistry 24z plus one of Biology 29y, Botany 27a, Zoology 26a.

Chemistry: Chemistry 22, 23, 24; Physics 26.

Mathematics: Mathematics 11 (if taken previously, one of Mathematics 22, 27, 32); Mathematics 25; Physics 26.

Physics: Physics 22, 23; Mathematics 25x; Mathematics 11 (if not taken previously).

THIRD YEAR

Religious Knowledge 34 or C36 or option

Humanities option

and one of the following major groups:

Biology: Chemistry 36, and 2½ of Biology 29y, 30b, Botany 23, 24, 27a, 36, 37b, Zoology 25b, 26a, 27, 28, 34a, 36b.

Pre-medicine: Chemistry 36x; and any 3 of the above Biology, Botany and Zoology courses.

Chemistry: Chemistry 34, 2 of: 33, 36, 332, 335.

Mathematics: Mathematics 33; and 2 of: Mathematics 22, 27, 32,37.

Physics: Physics 36; and 2 other Physics.

I. HONOURS BIOLOGY

Admission requirements: Grade XIII: nine papers including English (2 papers), another Language (2 papers), Mathematics (3 papers), Physics and Chemistry; or the equivalent subjects of Preliminary Year, with an overall average of at least 60%. (See page 83).

First Year General

	Hrs./wk. Lect.	Lab.
English 15, Library Science	3	
Philosophy 15	3	
Religious Knowledge C10 or 14 or Option	2	
Chemistry 10	3	3
Botany 10	2	3
Zoology 10	2	3
	15	9

For admission to Second Year Honours, the student must obtain an average of at least 66% in Botany, and Zoology, and an overall average of at least 60%.

Second Year Honours

Religious Knowledge C20 or 24 or Philosophy 22		2	
Physics 13		3	3
Chemistry 224z (Physical Chemistry)		2	
Chemistry 223 (Organic)		3	3
Botany 224 (Plant Taxonomy)		2	3
Zoology 222 (Comparative Vertebrate Zoology)		3	4
		15	13

Third Year Honours

Philosophy 25		3	
Mathematics 15		3	
Chemistry 336 (Biochemistry)		3	3
Biology 330b (Cellular Physiology)	(one sem.)	2	3
Biology 337y (Ecology)		2	
Botany 336 (General Microbiology)		2	3
One of: Botany 323 (Green Cryptogams)		2	3
Zoology 336 (Histology)			
(Attendance at Seminars required)			
		16	10½

Fourth Year Honours

Religious Knowledge 34 or C36 or Option		2	
Biology 329y (Genetics)		2	
Biology 441a (History of Biology)	(one sem.)	3	
Biology 442b (Evolution)	(one sem.)	3	
Zoology 328 (Entomology)		2	3
One of: Botany 440b (Plant Physiology)	(one sem.)	2	3
Zoology 440a (Animal Physiology)	(one sem.)	3	3
One of: Biology 443 (Biotechniques)		2	3
Botany 400 (Problems)			
Zoology 400 (Problems)			
One of: Botany 427a and 437b (General & Medical Mycology)		2	3
Zoology 327 (Invertebrate)			
Zoology 334a & 325b (Embryology and Parasitology)			
(Presentation of Seminars required)			
		15/16	10½

II. HONOURS CHEMISTRY

Admission requirements: Grade XIII English (2 papers), Language (2 papers), Algebra, Geometry, Trigonometry, Physics and Chemistry, with an average of at least 60% in Mathematics, Physics and Chemistry, and an overall average of 60%; or the equivalent subjects and grades of the Preliminary Year. (See p. 83). This program is accredited by the Chemical Institute of Canada.

First Year General

	Hrs./wk. Lect.	Lab.
English 15, Library Science	3	
Philosophy 15	3	
Religious Knowledge C10, or 14, or option	2	
Chemistry 10	3	3
Physics 10	3	3
Mathematics 11	2	2
Mathematics 15	3	
	19	8

For admission to Second Year Honours, the student must obtain at least 66% in Chemistry, 60% in Mathematics and Physics, and an overall average of 60%.

Second Year Honours

Religious Knowledge C20, or 24, or Philosophy 22		2	
Philosophy 25		3	
Mathematics 25ax, 25 bx		4	
Physics 26		3	3
Chemistry 232 (Quantitative Analysis)		2	6
Chemistry 223 (Organic)		3	3
Chemistry 224 (Physical Chemistry I)		2	
		19	12

Third Year Honours

Religious Knowledge 34, or C36, or option		2	
German or Russian A, or option		3	
Mathematics 35a	(1st sem.)	3	
Chemistry 332 (Intermediate Analytical)		2	3
Chemistry 333 (Intermediate Organic)		2	4½
Chemistry 335 (Inorganic)		2	1½
Chemistry 344 (Physical Chemistry II)		3	6
		17/14	15

Fourth Year Honours

German 2 or Russian 2 or option		3	
Mathematics 22x or Chemistry 336x (Biochemistry)		3	
Chemistry 444x (Physical Chemistry III)		2	
Chemistry 454 (Physical Chemistry IV)		2	
Chemistry 464 (Physical Chemistry V)		2	3
Chemistry 449 (Research)		1	13
Chemistry 450y (Seminar)		1	
		14	16

III. HONOURS CHEMISTRY AND BIOLOGY (BIOCHEMISTRY)

Admission requirements: Grade XIII: English (2 papers), Language (2 papers), Algebra, Geometry, Trigonometry, Physics and Chemistry, with an average of 60% in Chemistry, Mathematics and Physics and an overall average of 60%; or the equivalent subjects and grades of Preliminary Year (see p. 83).

This program is accepted by the Ontario Department of Education as academic qualification for the High School Assistant's Certificate Type A, Chemistry and Biology.

First Year General

	Hrs./wk. Lect.	Lab.
English 15, Library Science	3	
Religious Knowledge C10, or 14, or option	2	
Philosophy 15	3	
Mathematics 15	3	
Chemistry 10	3	3
Botany 10	2	3
Zoology 10	2	3
	18	9

For admission to Second Year Honours, the student must obtain at least 66% in Chemistry, 66% in Botany and Zoology, and an overall average of at least 60%.

Second Year Honours

Philosophy 25	3	
Physics 10	3	3
Chemistry 222: (Quantitative Analysis)	2	3
Chemistry 223: (Organic)	3	3
Chemistry 224 (Physical Chemistry I)	2	
Zoology 222 (Comparative Vertebrate Zoology)	3	4
	19	13

Third Year Honours

Religious Knowledge 34, or C36, or Philosophy 22	2	
Physics 26	3	3
Chemistry 333 (Intermediate Organic)	2	4½
Chemistry 334x (Physical Chemistry II)	3	
Chemistry 336 (Biochemistry)	3	3
Biology 330b (Cellular Physiology)	1	1½
Biology 337y (Ecology)	2	
Botany 336 (Microbiology)	2	3
	18	15

Fourth Year Honours

French A or German A or option	3	
Chemistry 444 (Physical Chemistry III)	2	3
Chemistry 446ab (Intermediate Biochemistry)	3	6
Chemistry 451y (Seminar)	1	
Biology 329y (Genetics)	2	
Botany 440b & Zoology 440a (Physiology)	2&3	3
Zoology 334a (Vertebrate Embryology)	1	1½
	14&15	13½

IV. HONOURS CHEMISTRY AND PHYSICS

Admission requirements: Grade XIII: English (2 papers), Language (2 papers), Algebra, Geometry, Trigonometry, Physics and Chemistry with an average of at least 60% in Mathematics, Physics and Chemistry, and an overall average of 60%; or the equivalent subjects and grades of Preliminary Year. (See p. 83).

This program is accepted by the Ontario Department of Education as academic qualification for the High School Assistant's Certificate, Type A, Physics and Chemistry. This program is accredited by the Chemical Institute of Canada.

First Year General

	Hrs./wk. Lect.	Lab.
English 15, Library Science	3	
Philosophy 15	3	
Religious Knowledge C10, or 14, or option	2	
Chemistry 10	3	3
Physics 10	3	3
Mathematics 11	2	2
Mathematics 15	3	
	19	8

For admission to Second Year Honours, the student must obtain at least 66% in Chemistry and Physics and an overall average of at least 60%.

Second Year Honours

Mathematics 25ax, 25 bx	4	
Chemistry 222 (Quantitative Analysis)	2	3
Chemistry 223 (Organic)	3	3
Chemistry 224 (Physical Chemistry I)	2	
Physics 222 (Optics)	3	3
Physics 223 (Electricity and Magnetism)	3	3
	17	12

Third Year Honours

Religious Knowledge 34, or C36, or Philosophy 22		2	
Philosophy 25		3	
Mathematics 35a	(1st sem.	3	
Chemistry 334 (Physical Chemistry II)		3	3
One of: Chemistry 333 (Intermediate Organic)		2	4½
Physics 350 (Theoretical Physics I)		3	
Physics 334 (Electronics)		2	
Physics 336 (Modern Physcis)		2	
Phvsics 370/2 (Junior Laboratory)			4
	1st sem. 17/18; 2nd sem.	14/15	11½

Fourth Year Honours: (Chemistry Division)

German A or Russian A or option		3	
Chemistry 444 (Physical Chemistry III)		2	3
Chemistry 332 (Analytical)		2	3
Chemistry 335 (Inorganic)		2	1½
Chemistry 451y (Seminar)		1	
Chemistry 464 (Physical Chemistry V)		2	3
Physics 466a (Solid State)	(1st semester)	2	
Physics 466b (Nuclear)	(2nd semester)	2	
Physics 470/1 (Senior Laboratory)			3
		14	13½

Fourth Year Honours: (Physics Division)

German A or Russian A or option		3	
Chemistry 444x (Physical Chemistry III)		2	
Physics 450 (Theoretical Physics II)		2	
Physics 453a (Classical Mechanics)	(1st semester)	3	
Physics 453b (Intro. to Quantum Mechanics)	(2nd semester)	3	
Physics 466a (Solid State Physics)	(1st semester)	2	
Physics 466b (Nuclear Physcis)	(2nd semester)	2	
Physics 470 (Senior Physics Laboratory)			9
		12	9

V. HONOURS MATHEMATICS

(Honours Mathematics and Physics, Mathematics Division)

Admission requirements: Grade XIII: English (2 papers), Language (2 papers), Algebra, Geometry, Trigonometry, Physics and Chemistry with an average of 60% in Chemistry, Mathematics and Physics and an overall average of 60%; or the equivalent subjects and grades of Preliminary Year. (See page 83.

This program is accepted by the Ontario Department of Education as academic qualification for the High School Assistant's Certificate, Type A, Mathematics.

First Year General

	Hrs./wk. Lect.	Lab.	Tut.
English 15, Library Science	3		
Philosophy 15	3		
Religious Knowledge C10, or 14, or option	2		
Chemistry 10	3	3	
Physics 10	3	3	
Mathematics 11	2		2
Mathematics 15	3		
	19	6	2

For admission to the Second Year Honours, the student must obtain at least 66% in Mathematics and Physics of First Year, and an overall average of at least 60%.

Second Year Honours

Philosophy 25	3		
Mathematics 227 (Modern Algebra)	3		1
Mathematics 229 (Anal. Geom., Modern Analysis)	3		1
Mathematics 254 (Intermediate & Advanced Calculus)	4		1
Physics 222 (Optics)	3	3	
Physics 223 (Electricity & Magnetism)	3	3	
	19	6	3

Third Year Honours

Religious Knowledge 34, or C36, or Philosophy 22	2
Russian A or German A or Option (Humanities)	3
Mathematics 300 (Analysis)	3
Mathematics 331 (Probability & Statistics)	3
Mathematics 338a (Functions of a Complex Variable)	1½
Mathematics 341 (Vector Analysis & Mechanics)	3
Mathematics 354 (Differential Equations)	3
	18½

Fourth Year Honours

Russian 2 or German 2 or Option (Humanities)		3
5½ of: Math 400 (General Topology)		2
Math 429b (Synthetic & Anal. Projective Geom.)		1½
Math 435y (Numerical Analysis)		1
Math 437 (Modern Algebra)		3
Math 444 (Theory of Functions of a Real Variable)		3
Math 448 (Theory of Functions of Complex Variable)		2
Math 449 (Differential Geometry, Relativity)		3
Math 450 (Hydromechanics, Electromagnetism)		3
Math 451 (Advanced Dynamics, Quantum Theory)		3
Math 453 (Methods of Applied Mathematics)		2
Physics 336 (Modern Physics)		⅔

Students intending to specialize in APPLIED MATHEMATICS are advised to select the following sequence of subjects: Physics 336; Mathematics 435y, 449, 450, 451, 453.

Students intending to specialize in PURE MATHEMATICS are advised to select the following sequence of subjects: Mathematics 400, 429b, 435y, 437, 444, 448, 449a.

Those intending to qualify for a HIGH SCHOOL ASSISTANTS' CERTIFICATE TYPE A may select any sequence of 5½ subjects mentioned above in consultation with the Head of the Department.

VI. HONOURS PHYSICS

(Honours Mathematics and Physics, Physics Division)

Admission requirements: Grade XIII: English (2 papers), Language (2 papers), Algebra, Geometry, Trigonometry, Physics, and Chemistry with an average of at least 60% in Mathematics, Physics and Chemistry and an overall average of 60%; or the equivalent subjects of Preliminary Year. (See page 83).

This program is accepted by the Ontario Department of Education as academic qualification for the High School Assistant's Certificate Type A, Mathematics and Physics, provided that Mathematics 451 is chosen in Fourth Year, in place of Physics 453ab.

First Year General

	Hrs./wk. Lect.	Lab.	Tut.
English 15, Library Science	3		
Philosophy 15	3		
Religious Knowledge C10, or 14, or option	2		
Chemistry 10	3	3	
Physics 10	3	3	
Mathematics 11	2	2	
Mathematics 15	3		
	19	8	

For admission to Second Year Honours, the student must obtain at least 66% in Mathematics and Physics of First Year, and an overall average of at least 60%.

Second Year Honours

Philosophy 25	3		
Mathematics 227 (Modern Algebra)	3		1
Mathematics 229 (Analytical Geometry)	2		1
Mathematics 254 (Intermediate & Advanced Calculus)	4		1
Physics 222 (Optics)	3	3	
Physics 223 (Electricity & Magnetism)	3	3	
	18	6	3

Third Year Honours

Religious Knowledge 34, or C36, or Philosophy 22	2	
German A or Russian A or Option	3	
Mathematics 354 (Differential Equations)	3	
Physics 331 (Thermodynamics)	2	
Physics 334 (Electronics)	2	
Physics 336 (Modern Physics)	2	
Physics 350 (Theoretical Physics I)	3	
Physics 370 (Junior Physics Laboratory)		6
	17	6

Fourth Year Honours

German 2 or Russian 2 or Option		3	
Mathematics 338a		1½	
Physics 450 (Theoretical Physics II)		2	
Physics 452 (Physical Optics)		2	
Physics 453a Classical Mechanics)	(1st semester)	3	
Physics 453b (Intro. to Quantum Mechanics)	(2nd sem.)	3	
Physics 466a (Solid State Physics)	(1st sem.)	2	
Physics 466b (Nuclear Physics)	(2nd sem).	2	
Physics 470 (Senior Physics Laboratory)			9
		13½	9

CERTIFICATE IN PUBLIC ADMINISTRATION

First Year

Bus. Ad 15a: A Survey of Business Organization and Management.

Bus. Ad 15b: Introduction to Financial Statements.

Pol. Sc. 20: Government of Canada.

Second Year

Bus. Ad 250: Principles of Accounting.

Pol. Sc. 22: Municipal Government.

Third Year

Bus. Ad 346a: Introduction to Personnel Management.

Bus. Ad 346b: Industrial Relations.

Pol. Sc. 32: Canadian Public Administration.

Three of the prescribed courses are from the field of Business Administration and three from Political Science. At the rate of two subjects per year, the minimum time required for the Certificate is three years. The student may, however, extend this period by taking only one course per year.

Since the program is primarily designed for experienced persons engaged in civil administration, regular applicants should be over 25 years of age. Those under 25 must have Senior Matriculation or its equivalent.

Students must obtain an overall "C" average in the six prescribed courses to merit the Certificate. No supplemental examinations may be written in any of the subjects of the Certificate Program.

THE SCHOOL OF BUSINESS ADMINISTRATION

BACHELOR OF COMMERCE

The purpose of the Bachelor of Commerce course is to develop educated men and women with a grounding in business ideas and techniques which will help equip them for positions of responsibility in industry and commerce. The course is designed to provide the broad outlook needed in modern business. In line with this objective, the first two years of the course emphasize the humanities and the social and physical sciences; the last two years provide for concentration in the Business Administration subjects, with three options taken outside the field of business.

Students in this course are not trained specifically as technicians, but are taught general procedure and methods of attack on problems. They are accustomed to independent study, and are encouraged to grapple with business problems on their own. The course is designed moreover to give students some awareness of the position and significance of business in the world today.

HONOURS BUSINESS ADMINISTRATION

Admission requirements: Nine Grade XIII papers, including English (2 papers), Language (2 papers), 2 Mathematics and three other papers, or the Preliminary Year (including Mathematics) (see p. 82):

First Year

English 15, Library Science

Philosophy 15

Religious Knowledge C10 or 14, or option

Option from First Year Arts and Science courses

Economics 19‡ (Principles of Economics)

Bus. Ad. 15a (Business Organization & Management)

Bus. Ad. 15b (Introduction to Financial Statements)

‡Economics 15 may be accepted at the discretion of the Director of the School of Business Administration.

For admission to Second Year Honours, the student should obtain an overall average of 60%, and an average of 60% in Business Administration 15ab.

Second Year Honours

English 21 (Selected Literature and Composition)
Mathematics 23 (Mathematical Analysis for the Social Sciences)
Economics 223 (Money and Banking)
Bus. Ad. 250 (Principles of Accounting)
Bus. Ad. 251 (Principles of Marketing)
Any second year full course in Arts and Science for which the student has the prerequisite.

Third Year Honours

One full course from Arts and Science*
Bus. Ad. 346ab (Personnel Management, Industrial Relations)
Bus. Ad. 350¶ (Intermediate Accounting) or Bus. Ad. 360 (Management Accounting)
Bus. Ad. 353 (Business Finance)
Bus. Ad. 355 (Statistical Methods in Business)
One of: Bus. Ad. 352ab (Advertising, Sales Management)
Bus. Ad 356¶ (Commercial Law)
A fourth year business option (full course)

Fourth Year Honours

One of: Philosophy 22, R.K. 24ab, R.K. C20, R.K. 34ab, R.K. C36
One full course from Arts and Science
Bus. Ad. 446a (Production Management)
Bus. Ad. 446b (Administrative Practices)
Bus. Ad. 480 (Business Policy)
Two full courses from:

Bus. Ad. 450a¶ (Advanced Accounting)
Bus. Ad. 450b (Tax Accounting)
Bus. Ad. 452a (Retailing)
Bus. Ad. 452b (Market Research)
Bus. Ad. 453 (Investment Fundamentals and Management)
Bus. Ad. 457b (Business Conditions)
Bus. Ad. 458a (Labour Law, Industrial Legislation)
Bus. Ad. 458b (Collective Bargaining)
Bus. Ad. 459 (Business Research)
Bus. Ad. 460a¶ (Auditing)
Bus. Ad. 470b¶ (Cost Accounting)
Any Bus. Ad. course not previously taken in the third year.

*The Arts and Science options in Second, Third and Fourth Years are to be chosen, with the approval of the Director of the School of Business Administration, to fulfill the desired sequence and concentration in the chosen fields.
¶Required for those intending to pursue an accounting career after graduation.

DIPLOMA COURSE IN MANAGEMENT

This is a one-year course for university graduates who have obtained a degree other than the Bachelor of Commerce or equivalent; the program is intended for persons who have not majored in Business Administration on their undergraduate programs. The following are the prescribed courses:

Bus. Ad. 481ab (Statistical Methods in Business)
483ab (Marketing)
485ab (Personnel Management, Industrial Relations)
489 (Accounting)
493 (Corporation Finance)

An overall "C" average in the five courses is necessary to obtain the Diploma. A student who has not completed a formal course in the principles of economics must make up the deficiency. A student completing the above courses with a "B" average may be admitted to the second year of the M.B.A. program.

CERTIFICATE IN BUSINESS ADMINISTRATION

First Year

Business Administration 15ab (1 evening, 3 hours)
Economics 15 or 19 (1 evening, 2 hours)

Second Year

Business Administration 250 (1 evening, 3 hours)
Business Administration 346ab (1 evening, 3 hours)

Third Year

Any two full-year senior Business Administration subjects not already taken (2 evenings, 3 hours each).

This program may be pursued only in the Evening Division. The minimum time for completion is three years; it may be spread over a longer period if the student wishes. These courses may be applied towards a Bachelor of Commerce degree.

This program is designed primarily for business men with experience. Applicants under twenty-five years of age will be expected to have Senior Matriculation standing or equivalent. Extension courses are available for this purpose.

The average required for the Certificate in Business Administration is an overall "C" average in the six courses. Supplemental examinations may not be written in any subjects which are to be counted for the certificate. In the event that an applicant has completed equivalent courses elsewhere, he may substitute other courses with the consent of the School of Business Administration.

THE SCHOOL OF NURSING

BACHELOR OF SCIENCE IN NURSING

I. REGULAR PROGRAM

The nursing degree curriculum is designed on the premise that professional nursing has its basis in the biological, social and psychological sciences, and that its practitioner must be a well developed person, capable of intellectual growth, and a competent member of the health team serving the needs of society, in the care of the sick as well as in the promotion of health and prevention of disease.

It qualifies the student to write the nurse registration examinations, and includes preparation for a selected specialty field.

Admission requirements: Grade XIII: English, Chemistry, Botany, Zoology; another language; and two other papers (or Preliminary Year Nursing; (see page 83).

First Year

English 15
Psychology 21
Philosophy 15
R.K. C10 or 14
or option
Sociology 11a
Biology 16a
Botany 16b
Nursing 10a or 16b *
Library Science

* For registered nurses only.

On completion of the First Year, the student enters a basic hospital school of nursing for clinical education and experience. The choice of school is made in consultation with the Director of the School prior to the end of the academic year. The student is expected to maintain contact with the Director of the School during her clinical education and experience. After this, the student re-enters the University for an additional year of specialized preparation in the field of Nursing Education, Nursing Service Administration or Public Health Nursing, as follows:

Students in the final year take the subjects of their elected specialty field.

Nursing Education

Psychology 26a; 31
Philosophy 25b
Nursing 16b; 30 a, b; 31; 32b; 33a

Nursing Service Administration

Psychology 26a; 31
Philosophy 25b
Nursing 16b; 30a, b; 36b; 37
Business Administration 346a

Public Health Nursing

Psychology 31, 26a
Philosophy 25b
Nursing 30a; 32b; 34; 35; 39b

II-A. DEGREE COURSE FOR REGISTERED NURSES

Admission requirements:

(a) Grade XIII English, Chemistry, Botany, Zoology, another language, and one other subject (or equivalent).

(b) Nurse's registration.

Students admitted to this two-year program leading to the degree of Bachelor of Science in Nursing take the First Year (substituting Nursing 16b for Nursing 10a) and the Final Year of the Regular Program outlined above.

II-B. DEGREE PROGRAM FOR REGISTERED NURSES

The purpose of this program is to permit students, who have already completed a university diploma level course in any of the specialized study areas, to advance towards a degree in nursing.

This becomes effectives in September, 1962, for all new registrants.

Admission Requirements:

1) As in Plan II-A

2) Evidence of successful completion of a Diploma Course in Nursing Education, or Nursing Service Administration, or Public Health Nursing.

3) Course Content

Biology 16a
Psychology 31
Botany 16b
English 15
*Philosophy 15
Philosophy 25b
Nursing 16b
Nursing 33y
**Nursing 36b
Nursing 38

*If previously taken one subject will be selected on advice of Director of the School from among: Psychology 22 or 34; Economics 15; Political Science 12; Philosophy 22.

**For students in Nursing Service Administration only.

DIPLOMA COURSES FOR REGISTERED NURSES

Admission requirements:

(a) Grade XII complete (see p. 82). Preference will be given to applicants with Grade XIII standing.

(b) Nurses's registration.

These courses extend over one full academic year. They are designed to enable the registered nurse to extend her education and prepare to function more effectively as a staff nurse in schools of nursing, hospital nursing service or health agencies. Credits obtained are applicable towards a degree, subject to the provisions stated under II-B.

1. Nursing Education

** Psychology 21, 26a
Sociology 11a
Orientation and Library Science
Nursing 16b, 30, 31, 32b, 33a

2. Nursing Service Administration

Library Science
** Psychology 21
Business Administration 346a
Nursing 16b, 30, 36b, 37
Sociology 11a

3. Public Health Nursing

** Psychology 21, 26a
Sociology 11a
Orientation and Library Science
Nursing 30a, 32b, 34, 35, 39b

Observation periods, seminars, and concurrent and terminal field experience are component parts of all specialty study programs on both diploma and degree levels.

** If Psychology 15 has been previously taken, Psychology 21 will be excused.

DETAILS OF SUBJECTS

Subject Code

Courses in the Preliminary Year are numbered 1-9 (General); courses in the First Year are numbered 10-19 (General); courses in the Second Year are numbered 20-29 (General) and 200-299 (Honours); courses in the Third Year are numbered 30-39 (General) and 300-399 (Honours); courses in the Fourth Year are numbered 400-499 (Honours). Graduate courses are numbered 500 and up.

A course designated by the letter "A" only, is, in difficulty and weight, equal to a Secondary School Grade Twelve (Ontario) course in the same subject.

Every subject extends over the complete academic year (two semesters) and counts as a full course, except where otherwise indicated. A course whose number is followed by "a", "b", or "y" is a half course, given usually in the first semester, the second semester, or throughout the year, respectively; the letter "c" indicates a half course, which may be taught either first or second semester. For semester hour equivalents, see p. 195.

The above code was adopted in 1958.

ANTHROPOLOGY

(see p. 194.)

BIOLOGY

Officers of Instruction: Professor: Rev. A. J. Grant, C.S.B., M.A. (Department Head); Associate Professors: W. G. Benedict, Ph.D.; R. J. Doyle, Ph.D.; C. C. Kuehner, Ph.D.; Assistant Professors: H. D. McCurdy, Ph.D.; Miss M. L. Moss, M.S.; M. L. Petras, M.Sc.

For major in general course, see p. 101; for Honours Biochemistry, see p. 105; for Honours Biology, p. 103; for graduate courses, p. 245.

I. Biology

1. **Principles of Biology:** The fundamental principles of biology with stress on the cell as a unit, the origin and preservation of the indiyidual and the race, the mode of inheritance, and the applications of biology to social and economic problems. Illustrated by examples from the botanical and zoological fields.

2 lectures, 2 laboratory hours a week.

1a. **Principles of Biology:** The fundamental principles of Biology stressing the organization and activity of cells and organisms, both plant and animal.

2 lectures, 2 laboratory hours per week; 1 semester (half course).

16a. **Chemical Aspects of Biology:** An introduction to chemical principles and organic compounds of biological application. This course is intended for students of nursing, and other fields, who desire a brief introduction to biological chemistry. It is a prerequisite for Botany 16b. (Prerequisites: Biology 1, Chemistry 1).

3 lectures, 3 laboratory hours per week; one semester (half course).

29y. **Principles of Genetics:** An introduction to Mendelian inheritance, chromosome and gene theory, and the genetic concept of species. (Prerequisite: Zoology 10 or Biology 1 and Math 1y or 4).

2 lectures a week (half course).

30b. **Cellular Physiology:** This course is designed to acquaint the student with the general principles and methods of cellular physiology and with laboratory techniques used in physiological investigation. (Prerequisites: Chemistry 23 and Physics 13. Corequisite: Chemistry 36x).

2 lectures, 3 laboratory hours a week; one semester (half course).

Honours Courses

329y. **Genetics:** An introduction to Mendelian genetics, chromosome and gene theory, genetic cytology and structure of genetic apparatus, linkage and crossing-over, sex-determination and linkage, cytogenetic aberrations, the nature and action of the gene, mutation and population genetics. (Prerequisites: Chemistry 36, Mathematics 1y or 4, Zoology 10).

2 lectures a week (half course).

330b. **Cellular Physiology:** An introduction to the principal problems and methods of cellular physiology including the effects of environmental factors, structure and function of cell organelles and plasma membrane; growth, respiration and irritability. The laboratory is designed to familiarize the student with some of the basic techniques employed in physiological investigation, notably manometric and electrometric methods. One term paper will be required. (Prerequisites: Chemistry 23, Physics 13; corequisite: Chemistry 36).

2 lectures, 3 laboratory hours a week; one semester (half course).

337y. **Ecology:** The study of organisms in relation to their environment. Individual plants and animals are treated, as well as communities and populations. (Prerequisites: Botany 10 and Zoology 10).

2 lectures a week plus field trips (half course).

441a. **History of Biology:** A study of the main contributions to Biology from the Greek period to the present time.

3 lectures a week, one semester (half course).

442b. **Evolution:** Topics included are history of evolution, basic evidence for evolution, summary of phylogeny of plants and animals, processes of evolution in terms of recent work, and the evaluation of evolution in terms of philosophy.

3 lectures a week, one semester (half course).

443. **Biotechniques:** Topics included are photography as applied to Biology, advanced microtechnique in Bacteriology and Histology, instrumentation (principles and methods of use of some instruments used in biological research) and the preparation of animals for anatomical and morphological studies.

2 lectures and 3 laboratory hours a week.

II. Botany

1a. **Elementary Botany:** The basic principles of Botany, including a brief survey of the plant kingdom.

2 lectures, 3 laboratory hours a week; one semester (half course).

10. **Introductory Botany:** Properties and activities of protoplasm and the anatomy and physiology of roots, stems, leaves, flowers and fruits. Type forms are studied as to their taxonomy, structure, growth, reproduction, ecology and economic importance of the Thallophytes, Bryophytes and Tracheophytes.

2 lectures and 3 laboratory hours a week.

16b. **Bacteriology for Nurses:** A survey of elementary bacteriology including structure, classification and physiology of bacteria with examination of the micro-organisms of medical importance. (Prerequisites: Biology 1 and 16a, Chemistry 1a).

3 lectures and 3 laboratory hours a week; one semester (half course).

23. **Green Cryptogams:** Introduction to the structure, reproduction, classification and growth of representative members of the green, non-flowering plants. (Prerequisite: Botany 10).

2 lectures, 3 laboratory hours a week.

24. **Plant Taxonomy:** Morphology, identification, nomenclature and classification of the flowering plants. Introduction to development of taxonomy, plant exploration, migration of floras, climate and natural vegetation, and phylogeny. (Prerequisite: Botany 10).

2 lectures, 3 laboratory hours a week.

27a. **General Mycology:** A study of the characteristics, habits and life-histories of various groups of true fungi. (Prerequisites: Botany 10, Chemistry 10, Zoology 10).

2 lectures, 3 laboratory hours a week; one semester (half course).

36. **General Microbiology:** Introduction to the structure, reproduction, classification, growth and metabolism and control and death of fungi, bacteria and viruses. The special aspects of microbiology, such as sanitary microbiology, immunology, industrial microbiology, microbial genetics and microbiology of special environments will also be surveyed. (Prerequisites: Zoology 10 and Botany 10 and Physics 13 and Chemistry 23).

2 lectures, 3 laboratory hours a week.

37b. **Clinical Mycology:** A study of the characteristics, habits, and life-histories of the various groups of higher fungi having clinical importance. Special emphasis is placed upon techniques and morphological characteristics used in the identification of the various mycoses. (Prerequisites: Botany 36, Chemistry 10).

2 lectures, 3 laboratory hours a week; one semester (half course).

Honours Courses

224. **Plant Taxonomy:** Morphology, identification, nomenclature, and classification of the flowering plants. Studies on modern systems of classification, plant exploration, migration of floras, climate and natural vegetation, and phylogeny of plants. A collection of suitably mounted and named plants is required of each student in this course. (Prerequisite: Botany 10).

2 lectures, 3 laboratory hours per week.

323. **Green Cryptogams:** Gross and microscopic analysis, collection and identification of representative members of the green non-flowering plants up to and including the Pteropsida. (Prerequisite: Botany 10).

2 lectures, 3 laboratory hours a week.

336. **General Microbiology:** A survey of the important groups of micro-organisms with emphasis upon the bacteria and viruses. Major topics considered will be the cytology, taxonomy, growth, nutrition, physiology, death and variation of these organisms. Minor topics will include host-parasite relations, pathogenicity, chemo-therapy, water, food and soil bacteriology. (Prerequisites: Botany 10, Chemistry 23; Chemistry 36 is advised as a co-requisite).

2 lectures, 3 laboratory hours a week.

400. **Undergraduate Problems Course in Botany:** The preparation of weekly reading assignments, the collection and preservation of specimens, cultures, slide preparations, etc.; the successful completion of written and oral examinations at the discretion of the Department.

(Full course.)

427a. **General Mycology:** A study of the biology of the true fungi with emphasis on the experimental approach. (Prerequisites: Chemistry 10, Botany 10).

2 lectures, 3 laboratory hours a week, one semester (half course).

437b. **Clinical Mycology:** A study of the characteristics and life histories of the pathogenic fungi. There will be special emphasis placed upon those techniques and morphological characteristics employed in the laboratory diagnosis of human mycotic infections. (Prerequisites: Chemistry 10, Botany 36).

2 lectures, 3 laboratory hours a week, one semester (half course).

440b. **Plant Physiology:** Study of the plant with regards to nutrition, metabolism, growth, absorption and translocation, permeability, and water relations. (Prerequisites: Chemistry 23, Botany 10, and Biology 330b).

2 lectures and 3 laboratory hours a week, one semester (half course).

III. Zoology

1a. **Introductory Zoology:** The principles of animal biology as illustrated by the study of certain typical forms; for students in Nursing and Home Economics.

2 lectures, 3 laboratory hours a week; one semester (half course).

10. **Introductory Zoology:** The principles of animal biology as illustrated by a study of the structure and physiology of representative forms.

2 lectures, 3 laboratory hours a week.

22. **Comparative Vertebrate Zoology:** Comparative function and structure of vertebrate organ systems. (Prerequisite: Zoology 10 or Biology 1 (60%).

3 lectures, 4 laboratory hours a week.

25b. **Parasitology:** A study of the various groups of animal parasites from the point of view of morphology, systematics and life history. In the laboratory, the methods of diagnosis of human diseases caused by parasitic protozoa and helminths will be emphasized. (Prerequisite: Zoology 10).

2 lectures, 3 laboratory hours a week; one semester (half course).

26. **Histology:** Microscopic study of epithelium, connective tissues, blood, muscles and nerves. Also a detailed study of the organs and organ systems of the body. (Prerequisite: Zoology 22). (Discontinued in 1961).

2 lectures and 3 laboratory hours a week.

26a. **General Histology:** Cytology, microscopic study of epithelium, connective tissue, blood, muscles and nerves. (Corequisite: Zoology 22 or 222).

2 lectures, 3 laboratory hours a week, one semester (half course).

27. **Invertebrate Zoology:** A survey of the principal lower animals, including their life cycles, comparative anatomy, physiology and embryology. (Prequisite: Zoology 10 or Biology 1 (60%)).

2 lectures, 3 laboratory hours a week.

28. **General Entomology:** Internal anatomy and physiology; external anatomy and its extension into the methods of classifying and identifying insect families. Introduction to the paleontological rise of insects, ecological studies and the control of insect pests. (Prerequisites: Zoology 10 or Biology 1 (60%), Botany 10).

2 lectures and 3 laboratory hours a week.

34a. **Embryology:** Origin and development of vertebrates. (Prerequisite: Zoology 22).

2 lectures, 3 laboratory hours a week; one semester (half course).

36b. **Special Histology:** Organology; microscopic study of the organs and organ systems of the body. (Prerequisite: Zoology 26a).

2 lectures, 3 laboratory hours a week, one semester (half course).

Honours Courses

222. **Comparative Vertebrate Zoology:** Phylogeny of the chordates; comparative analysis of the various organ systems and their physiology in chordates; selected reading and discussions. (Prerequisite: Zoology 10).

3 lectures, 4 laboratory hours a week.

325b. **Parasitology:** A study of the various groups of animal parasites from the point of view of morphology, systematics and life history. In the laboratory, the methods of diagnosis of human diseases caused by parasitic protozoa and helminths will be emphasized and the identification of arthropods of medical significance will be considered. (Prerequisite: Zoology 10).

2 lectures, 3 laboratory hours a week; one semester (half course).

327. **Comparative Invertebrate Zoology:** Phylogeny of the invertebrates; morphology; discussion of various systems and their function; life cycles; embryology; local invertebrate fauna. (Prerequisite: Zoology 10).

2 lectures, 3 laboratory hours a week.

328. **Entomology:** Anatomy, physiology and morphology of the insect body in relation to the classification of insects. Studies on the palaeontology, ecology, and control of economically important insects. A collection of suitably mounted and named insects is required of each student in this course. (Prerequisite: Zoology 10).

2 lectures, 3 laboratory hours a week.

334a. **Comparative Vertebrate Embryology:** Development of the vertebrates, based mainly on mammalian development, with frequent references to other vertebrates, especially birds; individual projects and reports. (Prerequisite: Zoology 222).

2 lectures, 3 laboratory hours a week; one semester (half course).

336. **Histology:** A microscopic study of the various tissues and organs with emphasis upon structure as related to function. The first semester is a survey of tissues: epithelium, blood, connective tissue, nervous tissue, cartilage and bone. The second semester is a survey of the various systems: nervous, integumentary, circulatory, digestive, respiratory, urinary, endocrine and the system of sensory receptors. (Prerequisite: Zoology 222).

2 lectures, 3 laboratory hours a week.

400. **Undergraduate Problems Course in Zoology:** The preparation of weekly reading assignments, the collection and preservation of specimens, cultures, slide preparations, etc., and the successful completion of written and oral examinations at the discretion of the Department. (Full course).

440a. **Animal Physiology:** A survey of the functions of the animal body with emphasis on the principles of chemistry and physics involved. Major topics considered will be blood and circulation, neuromuscular physiology, respiration, digestion, metabolism, endocrine glands, renal function and the nervous system. (Prerequisites: Chemistry 23, Physics 13, Zoology 222 or 22).

3 lectures, 3 laboratory hours a week; one semester (half course).

BUSINESS ADMINISTRATION

Officers of Instruction: Professor: G. R. Horne, Ph.D., (Director); Associate Professors: C. M. Birch, Ph.D.; M. Zin, Ph.D.; Assistant Professors: J. M. Brownlie, M.B.A.; J. B. Gertz, M.B.A.; W. Hanson, M.B.A.; Instructors: R. W. Meanwell, B.A., C.A.; A. B. Weingarden, B.A., Barrister-at-Law.

For Honours Business Administration program, see p. 112; for Diploma Course, p. 114; for Certificate p. 114; for graduate courses, p. 257.

15a. **A Survey of Business Organization and Management:** A survey of the functional areas of business: production, marketing, personnel and industrial relations, statistics, accounting and finance.

3 hours a week, one semester (half course).

15b. **Introduction to Financial Statements:** The principles underlying the construction of financial statements.

3 hours a week, one semester (half course).

Business Administration 15 is a prerequisite for all other courses in Business Administration.

Honours Courses

250. **Principles of Accounting:** An introduction to accounting concepts and techniques as tools for administration of the economic activity of the business enterprise; recording, reporting and interpreting the financial data of the business unit. A continuation of Business Administration 15b.

3 lectures, 2 laboratory hours a week.

251. **Principles of Marketing:** An introduction to the major problems of management in moving goods from the producer to the consumer. The development of skill in weighing alternatives and reaching mature decisions is a significant objective of the course.

3 hours a week.

346a. **Introduction to Personnel Management:** An analysis of the basic principles and procedures to be used in organizing and motivating a work force, with special emphasis on the role of the personnel staff specialist. Recruitment, selection and placement of employees, occupational movements, wage and salary administration, employee services, and education and training of employees and executives.

3 hours a week, one semester (half course).

346b. **Industrial Relations:** The impact of management and union institutions on employee relations. The case method is used in covering such topics as labour union structure, aims and operations, management objectives and functions, collective bargaining agreements, industrial conflict and dispute settlements, labour relations, legislation and public intervention in management-union activities.

3 hours a week, one semester (half course).

350. **Intermediate Accounting:** Cash and receivables, inventories, investments, plant assets and depreciation, wasting assets and depletion, intangibles, accounting for capital stock, dividends, surplus, reserves, bonds. Some attention is devoted to statement analysis and special statements, including the statement of application and source of funds.

3 hours a week.

352a. **Advertising:** A study of principles and methods of advertising, involving such areas as media, selection, programs, integration and demand factors. Primary emphasis is placed on advertising of consumer products from the point of view of the manufacturer, rather than that of the advertising agency or retailer.

3 hours a week, one semester (half course).

352b. **Sales Management:** The organization and management of the selling operation, including product development, branding, testing, sales organization and programs, training compensation, pricing.

3 hours a week, one semester (half course).

353. **Business Finance:** A comprehensive basic course; emphasis on analysis rather than description in order to demonstrate the application of principles. Included are analysis of the working capital problems of business enterprises from the managerial and budget point of view; forms of business organization; methods of raising capital; capital structures; fund administration; financing expansion; valuation; reorganization.

3 hours a week.

355. **Statistical Methods in Business:** The use of tables and charts, ratios and percentages, computation and use of averages, measures of dispersion, index numbers. In the second semester, time series and correlation are studied. By the use of cases, an attempt is made to illustrate the application of statistical methods in business.

2 lectures, 2 laboratory hours a week.

356. **Commercial Law:** Legal approach to business problems. Nature and source of law, crimes, torts, contracts, agency partnerships, corporations, real and personal property, sales, negotiable instruments, insurance and bankruptcy. A combination of case and textbook approach.

3 hours a week.

360. **Management Accounting:** Intended for the users of accounting information. Although procedures and techniques are not ignored, the emphasis is on the way in which accounting information can be used in the management process.

3 hours a week.

446a. **Production Management:** The problems and methods of analysis applicable to the manufacturing function in the modern enterprise. Purchasing, inventory control, production planning and control, methods study and work simplification, work standards, wage determination, cost control, plant location and layout. Case study and report writing are major aspects of the course.

3 hours a week, one semester (half course).

446b. **Administrative Practices:** An analysis of problems arising in the field of human relations throughout the various areas of business enterprise.

3 hours a week, one semester (half course).

450a. **Advanced Accounting:** Home office and branch relations; consolidated statements; governmental accounting; social accounting; special accounting problems; accounting literature and modern thought.

3 hours a week, one semester (half course).

450b. **Tax Accounting:** Through the use of problems, a survey is made of the Canadian income tax structure and practice, and its effect on individuals, partnerships, and corporations. The course also deals with estate planning and gift taxes.

3 hours a week, one semester (half course).

452a. **Retailing:** A study of marketing, sales management, advertising and research methods as they apply specifically to the retail field. The approach is from a point of view of both the large and the small retailer.

3 hours a week, one semester (half course).

452b. **Market Research:** The use of analytical methods to improve the efficiency of marketing operations; development of a broad understanding of the uses and methods of research as applied to marketing.

3 hours a week, one semester (half course).

453. **Investment Fundamentals and Management:** (i) First semester: the various types of corporate securities considered from the viewpoint of the individual investor; techniques of the security analyst in appraising securities. (ii) Second semester: the needs of different classes of investors and the shaping of portfolios to fulfill these needs; problems of the individual and the institutional investor.

3 hours a week.

456b. **Advanced Personnel Management:** Practical application of personnel principles and techniques to specific situations by use of the case-study method. The student is required to apply the logic of effective thinking to the solution of representative personnel problems. The methodology by which a course of action is determined is stressed, rather than the solution itself. (Prerequisite: Bus. Ad. 346a). (Discontinued in 1962).

3 hours a week, one semester (half course).

457b. **Business Conditions:** The purpose of this course is to provide background and training in the appraisal of the environment in which business operates. The course deals with the nature and causes of business fluctuations and the forecasting and control of such fluctuations.

3 hours a week, one semester (half course).

458a. **Labour Law and Industrial Legislation:** An analysis of legislation dealing with labour organization; wages; working conditions; fair employment practices and financial security of the worker.

3 hours a week, one semester (half course).

458b. **Collective Bargaining:** The techniques and procedures involved in contract negotiations and contract administration, with special emphasis on grievance procedures and arbitration. Principles are illustrated by means of case studies.

3 hours a week, one semester (half course).

459. **Business Research:** An introduction to research methods. The student will select a topic and, under direction, investigate and report upon it. Hours to be arranged (full course).

460a. **Auditing:** The duties and responsibilities of the auditor. Auditing procedure is studied with respect to the examination of business records and documents in order to determine their authenticity and the reliability of statements prepared from them. Attention is given to the problem of internal control. A sound knowledge of accounting principles is required for the course, which provides for an extensive review of that subject.

3 hours a week, one semester (half course).

470b. **Cost Accounting:** Development of accounting information which will help management in the minimization of the manufacturing and operating costs of the business; cost accounting systems applicable to various types of production methods; problems of burden allocation, analysis of variances, flexible budgets, the use of standard costs as a device for cost control.

3 hours a week (half course).

480. **Business Policy:** Application of the principles and techniques acquired in the basic courses to comprehensive management problems.

3 hours a week.

481a. **Statistical Methods In Business I:** The distinction between descriptive statistics and statistical inference, theoretical frequency distributions, measures of location and variation, probability, mathematical expectation, and sampling distributions.

3 hours a week, one semester.

481b. **Statistical Methods In Business II:** Problems of estimations, tests of hypotheses, sampling problems, small samples, regression, correlation, index numbers and time series.

3 hours a week, one semester.

483a. **Marketing Principles and Policies I:** Marketing policy formation and application to problems of consumers, merchandising and channels of distribution.

3 hours a week, one semester.

483b. **Marketing Principles and Policies II:** The management of personal selling and sales promotion, pricing, marketing research and integrated marketing programs.

3 hours a week, one semester.

485a. **Personnel Management:** The practical application of personnel principles and techniques to specific situations by use of the case-study method.

3 hours a week, one semester.

485b. **Industrial Relations:** A case course stressing worker-management relations under unionized conditions.

3 hours a week, one semester.

489. **Accounting:** Accounting concepts and techniques as tools for the administration of the economic activity of the business enterprise.

6 hours a week, one semester.

493. **Corporation Finance:** A basic course in business finance. Taught with emphasis on analysis rather than description with the object of demonstrating principles.

6 hours a week, one semester.

CHEMISTRY

Officers of Instruction: Professors: H. H. G. Jellinek, Ph.D. (Cantab), Ph.D. (London), F.R.I.C., Head; F. A. DeMarco, M.A.Sc., Ph.D.; Associate Professors: K. G. Rutherford, B.A., Ph.D.; R. J. Thibert, M.S., Ph.D.; Assistant Professors: E. W. Channen, B.A., Ph.D.; W. J. Holland, M.S., Ph.D.; S. J. W. Price, M.Sc., Ph.D.; Rev. G. W. Kosicki, C.S.B., B.A., M.S., Ph.D.; R. J. Niedzielski, M.S., Ph.D.

For the General course with Chemistry Major, see p. 101; for Honours Biology and Chemistry, p. 105; for Honours Chemistry, p. 104; for Honours Chemistry and Physics, p. 106; for graduate courses, p. 247.

1. **Basic Chemistry:** An elementary course including a a discussion of the elements, compounds, chemical reactions, periodic classification, chemical equilibria, atomic and nuclear structure. The various concepts in chemistry will be exemplified by the use of problems, demonstrations and laboratory exercises.
2 lectures (full year).
3 laboratory hours a week (one semester only).

1a. **Basic Chemistry:** An elementary course on the fundamentals of General Chemistry and the properties of the elements. Laboratory work to teach basic techniques in experimentation. (Discontinued, 1962).
3 lectures, 3 laboratory hours a week, one semester (half course).

10. **General Chemistry and Qualitative Analysis:** A course in general chemistry with special emphasis on the physical aspects. Course includes one lecture a week on Qualitative Analysis for one semester, three laboratory hours a week; General Chemistry for one semester and three laboratory hours a week of Qualitative Analysis for one semester. (Prerequisite: Chemistry 1a or Grade XIII Chemistry).
3 lectures, 3 laboratory hours a week.

22. **Quantitative Analysis:** An introductory course in the theory and practice of quantitative analytical chemistry. (Prerequisite: Chemistry 10).
2 lectures, 3 laboratory hours a week.

22m. **Quantitative Analysis:** An introductory course in the theory and practice of quantitative analytical chemistry, with emphasis upon volumetric analysis. (Prerequisite: Chemistry 10).
2 lectures a week, both semesters; 3 laboratory hours a week, one semester (full course).

23. **Organic Chemistry:** A fundamental approach to aliphatic and aromatic chemistry with practical laboratory experience. (Prerequisite: Chemistry 10).
2 lectures, 3 laboratory hours a week.

24. **Physical Chemistry I:** Thermodynamics and chemical equilibrium. (Prerequisites: Mathematics 15, Chemistry 10).
2 lectures a week.

24z. **Physical Chemistry:** Introductory course for students of Biology, pre-medicine and pre-dentistry. (Prerequisite: Chemistry 10).
2 lectures a week.

33. **Intermediate Organic Chemistry:** An intermediate course on the application of stereochemistry, kinetics and thermodynamics to organic chemistry. Heterocyclic compounds and absorption spectra. (Prerequisite: Chemistry 23).
2 lectures, 3 laboratory hours a week.

33x. **Intermediate Organic Chemistry:** The same as Chemistry 33, but without laboratory periods.
2 lectures a week.

34. **Physical Chemistry II:** Changes of state, solutions and phase equilibrium, kinetic theory, electrochemistry, introduction to reaction kinetics. (Prerequisite: Chemistry 24).
3 lectures, 3 laboratory hours a week.

36. **Biochemistry:** An introductory course in biochemistry with practical laboratory exercises. (Prerequisite: Chemistry 23).
2 lectures, 3 laboratory hours a week.

36x. **Biochemistry:** The same as Chemistry 36, but without laboratory periods.
2 lectures a week.

Honours Courses

222. **Quantitative Analysis:** An introductory course in gravimetric and volumetric analysis. (Prerequisite: Chemistry 10).
2 lectures, 3 laboratory hours a week.

223. **Organic Chemistry:** A fundamental approach to aliphatic and aromatic organic chemistry with special emphasis on the molecular orbital and resonance theories. (Prerequisite: Chemistry 10).
3 lectures, 3 laboratory hours a week.

224. **Physical Chemistry I:** Thermodynamics, chemical equilibrium. (Prerequisite: Mathematics 15, Chemistry 10).
2 lectures a week.

224z. **Physical Chemistry:** Introductory course for students of Biology, pre-medicine and pre-dentistry. (Prerequisite: Chemistry 10).

2 lectures a week.

232. **Quantitative Analysis:** The same as Chemistry 222, but includes a total of 6 laboratory hours a week.

332. **Intermediate Analytical Chemistry:** A course on quantitative analysis involving instrumental methods and special techniques. (Prerequisite: Chemistry 22 or 222 or 232).

2 lectures, 3 laboratory hours a week.

333. **Intermediate Organic Chemistry:** An intermediate course on the application of stereochemistry, kinetics and thermodynamics to organic chemistry. Heterocyclic compounds and absorption spectra. (Prerequisite: Chemistry 223).

2 lectures, 3 hours laboratory, first semester; 6 hours laboratory, second semester.

334. **Physical Chemistry II:** Changes of states, solutions and phase equilibria, kinetic theory, electrochemistry. Introduction to reaction kinetics. (Prerequisite: Chemistry 224).

3 lectures, 3 laboratory hours a week.

334x. **Physical Chemistry II:** The same as 334, but without laboratory.

3 lectures a week.

335. **Inorganic Chemistry:** A study of electronic structure and periodic relationships between the elements and binary compounds thereof, with emphasis on bond types, thermochemistry and structure. The descriptive chemistry of some of the more familiar inorganic species is considered, particularly in the light of the physiochemical methods used in studying these species in dry reactions, aqueous and non-aqueous solutions and gas phase reactions. (Prerequisite: Chemistry 10, and Chemistry 22 or 222 or 232).

2 lectures a week.
3 laboratory hours a week; one semester.

336. **Biochemistry:** An intensive general course with laboratory exercises designed to acquaint the student with the theory, problems, and laboratory procedures. (Prerequisite: Chemistry 23 or 223).

3 lectures, 3 laboratory hours a week.

336x. **Biochemistry:** The same as 336, but without laboratory.

3 lectures a week.

344. **Physical Chemistry II:** The same as 334, but a total of 6 laboratory hours a week is required.

444. **Physical Chemistry III:** Reaction kinetics, photo and radiation chemistry, chemical statistics. (Prerequisite: Chemistry 334 or 334x or 344).
2 lectures, 3 laboratory hours a week.

444x. **Physical Chemistry III:** The same as 444, but without laboratory.
2 lectures a week.

446. Renumbered 446a and 446b in 1962.

446a. **Intermediate Biochemistry:** A study of enzymes and biochemical research methods. (Prerequisite: Chemistry 36 or 336).
3 lectures, 6 laboratory hours a week, one semester.

446b. **Intermediate Biochemistry:** A study of hormones and biochemical research methods. (Prerequisite: Chemistry 36 or 336).
3 lectures, 6 laboratory hours a week, one semester.

449. **Research:** Original laboratory research in specialized topics.
1 lecture, 13 laboratory hours a week.

450y. **Seminar:** Discussion of selected topics from current literature.
1 hour a week (half course).

451y. **Seminar:** The same as 450y, but a literature paper is also required.
1 hour a week (half course).

454. **Physical Chemistry IV:** Solid state, atomic and molecular structure, introduction to quantum chemistry, theory of liquids. (Prerequisite: Chemistry 334 or 344).
2 lectures a week.

456a. **Intermediate Biochemistry:** Enzymes and introductory intermediary metabolism. (Prerequisite: Chemistry 36 or 336).
3 lectures a week; one semester (half course).

456b. **Intermediate Biochemistry:** Hormones. (Prerequisite: Chemistry 36 or 336).
3 lectures a week; one semester (half course).

464. **Physical Chemistry V:** Surface, colloid and polymer chemistry. (Prerequisite: Chemistry 334 or 344).
2 lectures, 3 laboratory hours a week.

464x. **Physical Chemistry V:** The same as 464, but without laboratory. (Prerequisite: Chemistry 334 or 344).
2 lectures a week.

CLASSICS

Officers of Instruction: Professor: Rev. J. M. Hussey, C.S.B., M.A. (Department Head); Assistant Professor: Charles Fantazzi, M.A.; Lecturer: Rev. D. G. Macdonald, C.S.B., M.A.

For major in general course, see p. 84; for Honours English and Philosophy (Language option) see p. 91.

I. GREEK

A. **Elementary:** Introduction to Greek grammar. Selected readings from Greek authors and the New Testament.
4 hours a week.

2. **Intermediate:** Selected shorter dialogues of Plato, the Apology of Socrates and a play of Aristophanes. Prose composition.
3 hours a week.

12. **Advanced:** Euripides' Alcestis and Bacchae. Selections from the history of Thucydides. Prose composition.
3 hours a week.

Honours Courses

322. Early dialogues of Plato. Speeches of Lysias and Demosthenes.
3 hours a week.

II. LATIN

A. **Elementary:** The work of Grade XII or its equivalent is covered.
4 hours a week.

2. **Intermediate:** Selections from Latin prose and poetry, composition and sight translation. (Prerequisite: Grade XII or equivalent).
3 hours a week.

12. **Advanced:** Selections from Martial and Pliny; Virgil's Aeneid II or VI; composition and sight translation. (Prerequisite: Latin 2 or Grade XIII).
3 hours a week.

21. **History of the Beginnings of the Roman Empire.** Tacitus' Annals and Suetonius' Lives of the Caesars will be read; concomitant readings in secondary sources. Prose composition and sight translation. (Prerequisite: Latin 12).
3 hours a week.

22. **Lyric Poetry:** Catullus and Horace; elegiac poets of the Augustan age. (Prerequisite: Latin 12).
3 hours a week.

23. **An introductory course in philosophical Latin, designed to give students in philosophy a reading knowledge of the texts of Thomas Aquinas.** (Prerequisite: Latin 2 or equivalent). (Discontinued, 1963).

2 hours a week.

24. **Medieval Latin:** Main emphasis on rapid reading and comprehension of philosophical and ecclesiastical Latin.

3 hours a week.

31. **Roman Satire:** Horace, Juvenal and selected epigrams of Martial. (Prerequisite: Latin 12).

3 hours a week.

32. **Roman Comedy:** Two plays of both Plautus and Terence. Later colloquial Latin as exemplified in Petronius' Satyricon. (Prerequisite: Latin 12).

3 hours a week.

33. **Lucretius and Cicero:** De Rerum Natura and Cicero's philosophical works. (Prerequisite: Latin 12).

3 hours a week.

35. **The Aeneid:** The entire poem will be read. (Prerequisite: Latin 12).

3 hours a week.

36. **Essays of Cicero: De Amicitia; De Senectute;** portions of other essays. (Prerequisite: Latin 12).

3 hours a week.

37. **Greek and Roman Mythology:** Its influence. (A reading course in English, without Classics prerequisite).

2 hours a week.

Honours Courses

222. **Lyric Poetry:** Study of Catullus' poems in the light of Alexandrian canons of style. Structural and linguistic analysis of Horace's Odes and Epodes. Selections from Tibullus and Propertius, and from various works of Ovid. (Prerequisite: Latin 12).

3 hours a week.

224. **Medieval Latin:** Later ecclesiastical and philosophical writers, with particular emphasis on the acquisition of a fluent reading knowledge of the texts of Thomas Aquinas.

3 hours a week.

331. **Roman Satire:** Complete investigation of the Roman genre of satire. Fragments of the earlier writers; intensive reading of Horace's Satires and Epistles, Juvenal and Persius. (Prerequisite: Latin 12).

3 hours a week.

332. **Roman Comedy:** Representative plays of Plautus and Terence. Origins and conventions of the ancient theatre. Reading in translation of the plays of Aristophanes and Menander. Examination of the colloquial Latin of the comedies and of Petronius' Satyricon. (Prerequisite: Latin 12).

3 hours a week.

333. **Lucretius and Cicero:** De Rerum Natura will be read in its entirety. Greek and Roman Epicurianism and atomist theories. Cicero's Tusculan Disputations, De Natura Deorum and De Oratore. (Prerequisite: Latin 12).

3 hours a week.

335. **The Aeneid:** Artistic design of the poem; study of epic conventions and diction; metrical analysis; use of Servius' Commentary. (Prerequisite: Latin 12).

3 hours a week.

450. **Virgil's Bucolics and Georgics:** Careful comparison of Virgil's poems with their Greek models; Virgilian poetic technique. The development of pastoral poetry in the vernacular languages and the ubiquitous influence of the Bucolics. (Prerequisite: Latin 12).

3 hours a week.

451. **Cicero's Speeches:** Rhetorical analysis of certain speeches; more rapid reading of others. (Prerequisite: Latin 12).

3 hours a week.

DRAMA

Director of Dramatics: Daniel P. Kelly, M.A.

20. **Use and Management of the Voice:** This course is a prerequisite for Drama 22, 30, 32, 34. The control and development of the voice. Gross anatomy and physiology of the speech mechanism; training in relaxation and poise; breath control; tone production; voice range and articulation. The principles of good voice production are applied and developed in practical classes and laboratory work. The class is especially recommended for students who intend to enter professions where good speech is an aid to accomplishment such as teaching, law, business, etc.

3 hours a week.

22. **Oral Interpretation:** Consideration of the problems of speech in performance of prose and verse for the purpose of interpretation. Rhythm and phrasing; structure and intellectual and emotional content of prose and poetry; imaginative interpretation; audience attention. Especially recommended for students who intend to enter professions where good speech is an aid to accomplishment, such as teaching, law, business, etc.

3 hours a week.

30. **Fundamentals of Acting:** The course of study includes the use of voice and speech in the theatre; expressive use of the body through stage movement; development of consideration, observation, imagination, and communicative movement through mime; the discovery and development of emotional equipment through improvisation; the utilization of these techniques by adjusting them to the forms required by the acting of scenes.

3 hours a week.

32. **Styles of Acting:** A study of the theories and techniques of acting in the various dramatic styles. The acting of scenes from different periods of drama including Classical Greek, Shakespeare, 18th Century English comedy, late 19th Century and the modern period. Drama 30 prerequisite.

3 hours a week.

34. **Direction:** The study and technique of the presentation of a play from the selection of the play to the completed production. The course includes style of staging and production; production practice; backstage organization, sight-lines and stage setting. Laboratory and workshop assignments include improvisation and direction of scenes. Drama 32 prerequisite.

3 hours a week.

36. **History of the Theatre:** A study of the development of theatrical art from its beginnings to the present day, stressing particularly the cultural background of the most important periods as manifest in the theatre architecture, decoration, and production techniques of these periods.

2 hours a week.

ECONOMICS AND POLITICAL SCIENCE

Officers of Instruction: Professor: *W. G. Phillips, Ph.D. (Department Head); Associate Professors: V. C. Chrypinski, Ph.D.; Z. M. Fallenbuchl, B.Sc. (Econ.), M.A., Ph.D.; W. L. White, M.A.; Assistant Professors: A. E. Kovacs, Ph.D.; W. J. Gillen, M.A.; *Rev. J. F. Callaghan, C.S.B., M.A.; Lecturer: P. J. Young, M.A.

*On leave, 1962-63.

I. ECONOMICS

For major in the general course, see p. 84. Students in third year who have maintained standards acceptable to the department, may be permitted to select one or both of their major options from among the honours courses shown below. A combined major between Economics and Political Science may be arranged with the permission of the department. For Honours Economics and Political Science, see p. 86; for Honours History (Economics option), see p. 94; for graduate studies, p. 240.

15. **Principles of Economics:** Basic principles of economic activity, factors affecting national income, prices, income distribution, and international trade.
2 hours a week.

19. **Principles of Economics:** This course follows the same general lines as Economics 15, but takes the student to a more advanced level of economic theory and analysis.
3 hours a week.

Economics 15 or 19 is prerequisite for all other courses in Economics.

21. **Economic Theory:** An intensive course in price theory, and some aspects of distribution theory.
3 hours a week.

23. **Money and Banking:** Theory and policy in financing economic activity.
3 hours a week.

31. **Public Finance:** Theory and policy in government finance.
3 hours a week.

34. **Introduction to Statistics:** The use of statistical methods in Economics.
2 lectures, 2 laboratory hours a week.

36. **Economics of Labour:** Problems and policies affecting labour in North America.
3 hours a week.

37a. **Economic History of Europe.**
3 hours a week, first semester (half course).

37b. **Economic History of the United States.**
3 hours a week, second semester (half course).

Honours Courses

Honours courses, assigned at the discretion of the Department Head, may form part or all of the requirements for the first year of the two-year program leading to the degree of Master of Arts.

218. **Geography of World Resources and Industries:** Trade routes and centres; the world's physical resources, their nature, utilization and transportation.
3 hours a week.

221. **Pricing Theory and Policy:** An intermediate course in demand, supply and the pricing process under the various forms of market organization; the nature of profits and the profit-making process; productivity and cost of production; special problems in the theory of monopoly and imperfect competition, with their implications for public policy. An introduction to three-variable analysis is made at the end of the course.
3 hours a week.

223. **Money, Banking and National Income:** The characteristics and functions of money; the monetary systems and banking organization in Canada, the United States and Great Britain; national income and expenditure; the theory of income, employment, interest and prices; economic growth and fluctuations; monetary and fiscal policy.
3 hours a week.

237a. **Economic History of Europe.**
3 hours a week, first semester (half course).

237b. **Economic History of the United States.**
3 hours a week, second semester (half course).

301. **International Economics:** Theory and empirical foundations of international trade; volume and pattern of trade and capital movements; balance of payments and international monetary relations; balance of payments adjustment process and the foreign exchanges; artificial obstacles to international trade—exchange control, tariffs, quotas; current international economic problems; various regional and world-wide institutions for promotion of currency convertibility and trade; economic development of under-developed areas.
3 hours a week.

331. **Public Finance:** The principles and problems of public finance with emphasis on the use of government finances as a stabilizing device; taxation problems, and the economics of the public debt. The second semester includes an intensive study of problems of public finance in Canada, particularly dominion-provincial fiscal relations.
2 hours a week.

334. **Statistical Methods:** The application of statistical methods to Economics; graphical methods and tabulation; frequency distributions; measures of central tendency and deviation; probability; the normal curve; correlation; reliability and validity; times series; index numbers.

2 lectures, 2 laboratory hours a week.

336. **Economics of Labour:** The development and present structure of the labour movement in North America, legislation affecting the status and activities of organized labour; wage and employment problems; methods of dealing with labour disputes; policies and practices in collective bargaining.

3 hours a week.

338. **Economic History and Current Economic Policies of Canada:** The economic development of Canada from the beginning of settlement to the present day. Current problems and policies in the Canadian economy, including agriculture, transportation, resources development and anti-trust policy.

3 hours a week.

353. **Corporation Finance and Investments:** (a) The promotion and financing of business enterprises, financial controls and dividend policies. (b) The principles of investments, individual and institutional; social importance.

3 hours a week.

400. **History of Economic Thought:** The evolution of economic thought from medieval times to Marshall, with particular emphasis on the criticism of the original writings of the English Classical economists, Marx, the Marginal Utility School and Marshall.

2 hours a week.

401. **Economic Organization and Public Policy:** The industrial structure of North America, using price theory as the basis of analysis of selected industries. Emphasis is given to problems of industrial concentration, differentials in scale economics and productivity, commercial policy and control of combines and restrictive trade practices. Some comparative analysis is made of British and European conditions.

2 hours a week.

402. **Government and Economic Life:** The nature and extent of state activity in the economic life of Canada, England, Australia, New Zealand and the United States. An examination is made of the regulatory functions of the government and direct economic intervention by government in the Commission, corporate and other forms.

2 hours a week.

406a. **Business Cycles:** A study of the history, nature and causes of economic fluctuations as a feature of the process of economic growth; monetary and fiscal policies for maintaining full employment and preventing inflation.

2 hours a week, first semester (half course).

406b. **Economic Development:** The analysis of economic growth; cultural, social and political aspects of economic development; geographical conditions; population and labour aspects; accumulation of capital; technology and entrepreneurship; the process of transformation; domestic and international measures for the development of underdeveloped countries; the Soviet policy of economic development; alternative policies.

2 hours a week, second semester (half course).

410. **Modern Economic Theory (non-Monetary):** An intensive course in selected current theories of value, production and distribution, under conditions of pure and monopolistic competition.

2 hours a week.

430. **Introduction to Econometrics:** (a) The use of economic theory in formulating economic models suitable for empirical research. (b) The application of statistical inference to these models. The second semester includes a survey of some of the less complex econometric studies.

2 hours lectures and 2 laboratory hours a week.

431. Renumbered 331 in 1963.

432b. **The Soviet Union: Economic System:** The communist economic theory, institutions and policies as applied in the U.S.S.R. and Soviet-dominated countries. It is recommended that this course be taken in conjunction with Political Science 432a.

2 hours a week, second semester (half course).

II. POLITICAL SCIENCE

For major in general course, see p. 84; for Honours Economics and Political Science, see p. 86.

12. **Introduction to Political Science.**

3 hours a week.

20. **Government of Canada:** Federal, provincial and local government.

2 hours a week.

21. **American Government.**
3 hours a week.

22. **Municipal Government:** A survey of functions and administration of municipal government and its place in the structure of Canadian government on the provincial and federal levels.
2 hours a week.

31. **Major Foreign Governments:** Governments and politics of selected modern countries.
3 hours a week.

32. **Canadian Public Administration:** An intensive study of Canadian public administration at the national level. An examination of departmental and independent agency organization, with special attention to administrative discretion and financial administration.
3 hours a week.

Honours Courses

212. **Elements of Political Science:** (a) The state, its origin and activities; evolution, structure and function of democratic government and institutions, particularly in Canada, the United Kingdom, the United States. (b) Political ideas of Capitalism, Communism, Socialism and Fascism, and the relationship of each to modern democracy.
3 hours a week.

220. **Canadian Government and Politics:** General character of the Canadian Government and constitutional system. Structure, powers and functions of the executive, legislative and judicial branches at the national, provincial and local levels. Problems of federalism; franchise, elections, political parties, pressure groups, public opinion.
3 hours a week.

221. **American Government:** A study of American Government as set forth in the Constitution. Particular attention is given to the organization, procedure and functioning of the National Government.
3 hours a week.

331. **Comparative Government.** The governments and politics of the United States, the United Kingdom, France, Italy and Germany. Consideration is given to the problem of European unification.
3 hours a week.

334. **The Commonwealth of Nations:** A study of the Commonwealth of Nations as an organization of autonomous nations, and a survey of the governmental structures and politics of its components.

3 hours a week.

432a. **The Soviet Union: Government and Politics.** The organization and operation of the government of the U.S.S.R. A survey of contemporary Soviet political issues and problems. (It is recommended that this course be taken in conjunction with Economics 432b).

2 hours a week, first semester, (half course).

443. **International Politics:** A study of international politics and organizations; an examination of nationalism, imperialism and other fundamental and persistent forces in world politics.

2 hours a week.

452. **History of Political Thought:** (a) The development of political theory from the classical period to the end of the 18th century. (b) A critical examination of modern political theories.

2 hours a week.

ENGLISH

Officers of Instruction: Professors: Rev. C. P. Crowley, C.S.B., Ph.D. (Department Head); Rev. H. V. Mallon, C.S.B., M.A.; Associate Professors: Miss Mary Manley, Ph.D.; J. F. Sullivan, Ph.D.; Assistant Professors: Rev. R. Flood, C.S.B., M.S.L.S.; E. D. LeMire, Ph.D.; E. J. McNamara, M.A.; G. A. Padley, B.A., Dip. Ed., D.U.P.; H. F. Plante, M.A.; Rev. E. C. Pappert, C.S.B., Ph.D.; Lecturer: Mrs. R. M. Birch, M.A.

For major in general course, see p. 84; for Honours English Language and Literature, p. 87; for Honours English and French, p. 88; for Honours English and History, p. 89; for Honours English and Philosophy, pp. 90 and 91; for Honours English and Spanish, p. 92; for graduate program, p. 242.

5. **General Literature and Composition:** (Prerequisite: Grade XII English).
4 hours a week.

11. **Communication Skills:** The methods of exposition as related to reports and business letters, with appropriate readings. (Discontinued, 1961.)
2 hours a week.

15. **General Literature and Composition:** A survey of English Literature, with emphasis on the great writers. Numerous essays and exercises will be required. (Prerequisite: English 5 or Grade XIII English).
3 hours a week.

21. **Selected Literature and Composition:** A reading of selected literature designed to acquaint the student with ideas and values significant in Western culture; the development of writing skills through the practice of prose composition.
3 hours a week.

No student will be registered in any of the following courses until he has successfully completed English 15.

22. **Literature of the Nineteenth Century:** 3 hours a week.

31a. **The Critical Reading of Selected English, American and Continental Fiction:** representative short stories and novels.
2 hours a week, one semester (half course).

33y. **Creative Writing:** Limited to fifteen students. Those wishing to register in the course should submit manuscripts to the Department of English before September 1.
1 hour a week (half course).

34. **Comparative Literature:** 3 hours a week.

35. **Shakespeare: Tragedies, Comedies and Histories.** Shakespearean criticism. 3 hours a week.

36. **Modern British and American Drama.** 3 hours a week.

38. **American and Canadian Literature** (English-Canadian only.) 3 hours a week.

39. **Recent Literature in English.** 3 hours a week.

Honours Courses

Comprehensive examinations will be held at the end of the Fourth Year of all courses in English Honours.

Honours courses, assigned at the discretion of the Department Head, may form part or all of the requirements for the first year of the two-year program leading to the degree of Master of Arts.

212y. **Greek Literature in English Translation:** A survey of Greek literature for those without a reading knowledge of Greek.
1 hour a week (half course).

236. **Modern British and American Drama.**
3 hours a week.

250. **Restoration and Eighteenth Century Literature (1662 to 1780).** 2 hours a week.

254. **Criticism, Scholarship and Bibliography:** A general introduction to English studies.
2 hours a week.

333. **Philosophical Ideas in Modern English Literature:** A philosophic analysis of the ideas in contemporary poetry and fiction. Readings in Hopkins, Eliot, Yeats, Auden, Frost, Joyce, James, Woolf and others.
2 lectures, 1 seminar hour a week.

335. **Shakespeare: Tragedies, Comedies and Histories.** A study of the plays and related criticism.
3 hours a week.

350. **Literature of the Romantic Revival (1780-1832).**
3 hours a week.

356. **English Drama to 1642:** With particular attention to the plays of Shakespeare.
3 hours a week.

357y. **The History of the English Language.** (Combined with English 363y in 1962 to form one full course, English 363.)
1 hour a week (half course).

358. **American and Canadian Literature.** (English-Canadian only.) 3 hours a week.

363y. **Old and Middle English Language and Literature.** (Combined with English 357y in 1962 to form one full course, English 363.)
2 hours a week, (half course).

363. **Old and Middle English Language and Literature:** The translation of Old English prose and poetry; grammar and syntax; readings in Chaucer; studies in the development of the English language; history of literature to 1400.
3 hours a week (2 lectures plus seminar).

441y. **Creative Writing.**
1 hour a week (half course).

447. **The History of the English Language:** the development of the English language to the present day studied under the following major aspects: grammar, syntax, vocabulary and sounds.
2 hours a week.

450. **Renaissance Literature, Non-Dramatic (1500-1660).**
3 hours a week.

459. **Recent Literature in English.** 3 hours a week.

460. **Literature of the Victorian Period. (1832-1900).**
3 hours a week.

463. **Advanced Middle English Language and Literature:** Chaucer and Langland; the study of representative prose and poetry. 1150-1400; history of literature.
2 hours a week.

470y. **English Tutorial:** Studies in English language and literature, directed by members of the department.
1 hour a week (half course).

FINE ARTS

Associate Professor: J. N. DeLauro, M.F.A.

10. **Introduction to Drawing, First Year:** Experimenting with various mediums and techniques. Subject matter: still life, landscape and nature study; individual and studio criticism.

2 lectures, 2 laboratory hours a week.

11. **Introduction to Sculpture:** Introduction to modelling, carving and casting in plaster; individual and studio criticism. (No previous experience required.)

2 lectures, 2 laboratory hours a week.

12. **History of Art:** First Year. History of Art from prehistoric to mediaeval art with an introduction to composition and the language of the plastic arts and relationships to its culture.

3 hours a week.

20. **Drawing and Design.** Second Year. Introduction to life drawing with emphasis on anatomy and construction and the importance of the figure to design; individual and studio criticism.

4 hours a week.

21. **Sculpture and Design.** Second Year. Emphasis on design and its relations to different media, also the investigation into theory and practice of sculpture in our society; individual and studio criticism.

4 hours a week.

22. **History of Art.** Second Year. From Italian renaissance to twentieth century art with emphasis on the influence of social and philosophical ideas on the arts.

3 hours a week.

FRENCH

(See p. 167)

GEOGRAPHY

Assistant Professor: P. E. Vandall, M.A.

For major in general program, see p. 84.

10. **Elements of Geography:** The earth as the home of man; the elements of the physical and cultural landscape with special reference to their world patterns.

2 lectures and 2 hours practical work a week.

19. **Geography of World Resources and Industries:** Trade routes and centres; the world's physical resources; their nature, utilization and transportation.

3 hours a week.

21. **Advanced Physical and Cultural Geography:** Studies of the environmental factors and their inter-relationships with special reference to Southwestern Ontario. (Prerequisite: Geography 10.) (Discontinued, 1962.)

2 lectures and 2 hours of practical work a week.

22a. **Geomorphology:** The study of landforms, including an analysis of origins, theories of evolution, classifications and effects on land-use. (Prerequisite: Geography 10.)

2 lectures, 2 hours practical work a week (first semester).

22b. **Cartography:** The study of the techniques and problems of representing geographical data on maps, graphs, charts and block diagrams. Laboratory work will include local field study and air photo interpretation. (Prerequisites: Geography 10 and 22a.)

2 lectures, 2 hours laboratory a week (second semester).

24. **World Regional Geography.** (Prerequisites: Geography 10, 19, or equivalent).

3 hours a week.

32. **Climatology:** The analysis of atmospheric disturbances and their distribution, climate controls, climatic records, climatic classifications and climatic changes. (Prerequisite. Geography 10.)

2 lectures, 2 hours laboratory a week.

33. **Political Geography:** A survey of the effect of geography on political relations. Geopolitical theories and principles will be discussed and studies made of modern political problems especially on the basis of territorial characteristics. (Prerequisites: Geography 10, 19 and 24.)
3 lectures a week.

34. **Geography of Canada:** The natural wealth of Canada and its conservation. (Prerequisites: Geography 10, 19, or equivalent).
3 hours a week.

Honours Courses

219. **Geography of World Resources and Industries:** Trade routes and centres; the world's physical resources; their nature, utilization, and transportation.
3 hours a week.

324. **World Regional Geography:** A systematic survey of the major natural and political regions of the world. (Prerequisites: Geography 10, 19, or equivalent.)
3 hours a week.

334. **Geography of Canada:** The natural wealth of Canada and its conservation. The geographic bases of human occupance in Canada; conservation of natural resources. (Prerequisites: Geography 10, 19, or equivalent.)
3 hours a week.

GEOLOGY

Lecturer: Rev. A. J. Weiler, C.S.B., B.A.

10. **Introductory Course in Geology:** Minerals and rocks, geological processes and their results; structure of the earth; practical application of geology; fossils and their use; an outline of the earth's history.
2 lectures and 2 laboratory hours a week. Field trips.

10e. Contents same as Geology 10.
2 lectures a week, both semesters; 2 laboratory hours a week, first semester, one laboratory hour a week, second semester.

GERMAN

(See p. 168.)

GREEK

(See p. 135.)

HISTORY

Officers of Instruction: Professor: Rev. D. J. Mulvihill, C.S.B., Ph.D. (Department Head); Associate Professors: Rev. F. J. Boland, C.S.B., Ph.D.; Rev. J. P. O'Meara, C.S.B., Ph.D.; Assistant Professor: J. K. Farrell, Ph.D.; Lecturers: Rev. R. S. Rayson, M.A., S.T.B., D.D.; M. Vuckovic, M.A.; H. N. Wallace, M.A.; **For Canterbury College:** Associate Professor: Rev. H. G. Hill, M.A., L.Th.; **For Holy Redeemer College:** Associate Professor: Rev. D. L. Egan, C.Ss.R., S.T.L.; Assistant Professor: Rev. J. S. McCormick, C.Ss.R., M.A.

For major in general course, see p. 84; for Honours History (Economics Option), see p. 94; for Honours English and History, p. 89; for Honours History Philosophy Option), p. 95; for graduate courses, p. 242.

4. **History of the Americas:** A study of the rise and growth of the various American nations and their relations with one another, against their respective geographical, economic and cultural backgrounds. (At Holy Redeemer College only).
3 hours a week.

10. **Mediaeval, Renaissance and Reformation History.**
3 hours a week.

11. **The Development of Christian Civilization:** A survey of the development of Christian civilization and thought from the time of Christ to the present, with special attention to the role of the Church.
2 hours a week.

22. **History of Canada:** A survey from the beginning of the French Regime to the present.
3 hours a week.

23a. **The Development of Self-Government in the British Empire-Commonwealth.** (Discontinued in 1963).
3 hours a week, one semester (half course).

24. **History of England:** A lecture and reading course on the political and cultural development of England from the Roman Conquest to 1837.
2 hours a week.

26. **Western Civilization and Thought:** From the fall of the Roman Empire to the end of World War II. This is a survey course for those not majoring in history; because of similarity of content, students who have credit for History 10, 11 or 36 may not take this subject for credit.
2 hours a week.

27. **Ancient Civilizations:** The Near East, Greece and Rome.
3 hours a week, lectures and seminars.

30. **The Canadian Political Tradition - 1837 to Present:** A study of the development of political thought and political parties in Canada.
3 hours a week.

31. Renumbered 22 in 1963.

32. **British North America 1815 - 1867:** A regional and social approach.
3 hours a week.

34. **History of the United States.** 2 hours a week.

35. **History of Latin America:** The colonial and republican periods; the cultural, institutional and political development of the Latin countries of the western hemisphere.
3 hours a week.

36. **Modern History (1555-1933).** 3 hours a week.

37. **History of Russia:** Origins to the fall of the Monarchy.
3 hours a week.

38. **Diplomatic History of the United States:** From 1790 to the present. 3 hours a week.

39. **Intellectual History of Russia.** Discontinued in 1963.
3 hours a week.

Honours Courses

Honours courses, assigned at the direction of the Department Head, may form part or all of the requirements for the first year of the two-year program leading to the degree of Master of Arts.

222. **History of Canada:** A survey from the beginning of the French Regime to the present.
3 lectures and a seminar a week.

236. **Modern History:** 1555-1933.

3 hours a week, lectures and seminars.

257. **Ancient Civilizations:** Prehistoric culture from the Paleolithic Age to the dawn of civilization. The political, social, economic and cultural history of the Near East and Egypt. The origin, development, achievement and decay of the Greek city-state from the time of Homer to Alexander the Great, with particular emphasis on Greek culture and Greek contributions to modern civilization. The political and social development of the Roman state from its origins to the Augustan age with particular attention paid to the collapse of the Republic and the Principate.

3 hours a week.

324. **History of England:** The political and cultural development of England from the Roman Conquest to 1837.

2 lectures, 1 seminar a week.

330. **The Canadian Political Tradition - 1837 to Present:** A study of the development of political thought and political parties in Canada.

3 hours a week.

331. Renumbered 220 in 1963.

332. **British North America 1815 - 1867:** A regional and social approach.

3 hours a week.

333. **History of the British Commonwealth:** (i) Development of the British Empire and Commonwealth with emphasis on European and English expansion at the time of the Tudors; American colonization, rapid growth of British overseas possessions and of imperial government during the Stuart period; post-Restoration and Hanoverian policies and development in the Empire; the end of the First Empire. (ii) Foundations and development of the Second Empire; the role of Canada, Australia, New Zealand; the position of India; the birth of the modern Commonwealth; Canada's contribution; the Irish situation; the growth of African and Asian parts of the Empire; the contemporary Commonwealth as a multiracial, functional family of nations.

3 hours a week.

333b. **The Development of Self-Government in the British Empire-Commonwealth.** (Discontinued in 1963).

3 hours a week, lectures and seminars; one semester (half course).

334. **History of the United States:** The colonial period, the revolution, making of the constitution, westward development, the slavery struggle, the Civil War, reconstruction and later political history to the present day; the character of federal and state governments.

3 hours a week, lectures and seminars.

335. **History of Latin America:** The colonial and republican periods; the cultural, institutional and political development of the Latin countries of the western hemisphere.

3 hours a week.

337. **History of Russia: Origins to the Fall of Monarchy:** (i) The political and economic growth, cultural and religious factors, the growth of foreign relations and the expansion of the State until the 19th Century. (ii) The history of Russia from the beginning of the 19th Century to the Fall of the Monarchy, with special emphasis on the development of the revolutionary movement in Russia. (Prerequisite History 36 or 236).

3 hours a week, lectures and seminars.

356a. International Relations and World Problems: 1918-present. (Prerequisite: History 236). (Discontinued in 1963).

3 hours a week, lectures and seminars; one semester half course).

358. Renumbered 458 in 1963.

425. **History of European Diplomacy 1815 to Present:** (i) Diplomacy in theory and practice;(ii) History of British Foreign Policy in Europe, 1815 - 1914; (iii) International relations and world problems in the 20th Century. (Prerequisite: History 236 or 36).

3 hours a week, lectures and seminars.

434. **Renumbered 334 in 1962.**

438. **Diplomatic History of the United States:** The diplomatic aspect of the War for Independence; American international relations after 1789; occupation of the West; international aspects of the Civil War; American Imperialism; Spanish-American War; First World War; League of Nations; Caribbean and Pacific problems since 1920; foreign policy since 1933; Second World War; post-war problems and the United Nations.

3 lectures and seminar.

439. **History of U.S.S.R.:** Revolutionary trends of the 19th and early 20th centuries; Marxian and non-Marxian roots of the Revolution; the February and October Revolutions and the Civil War; doctrinal foundations of the new order and subsequent ideological changes; economic and political structure; international relations and foreign policy. (Prerequisite: History 36 or 37 or 236 or 337).

3 hours a week, lectures and seminars.

452. **History of European Society and Institutions:** In the first term Continental Europe to 1648 will be studied. In the second term the course deals with the social and constitutional history of England to 1660 and emphasizes the use of documents.

3 hours a week, lectures and seminars.

455. **British Political Parties:** The rise of the Tory, Whig, Conservative, Liberal, Irish Parliamentary, Unionist and Labour Parties.

3 hours a week, lectures and seminars.

458. **Canada - Autonomous State - 1867 to Present:** Macdonald, Laurier, to Canada's emergence as a nation and its responsibilities.

3 hours a week, lectures and seminars.

461. **Canadian-American Relations, 1785 to 1962:** Special emphasis on Post World War II economic, defence and cultural interests.

3 hours a week.

HOME ECONOMICS

Officer of Instruction: Lecturer: Sr. Mary Romana, S.N.J.M., M.S.

For major in general course, see p. 84.

10. **Textiles and Clothing:** A course dealing with the structure and properties of textile fibres; identification of natural and synthetic fibres; the principles of costume design in relation to color, line and style suitable to the individual; the application of the fundamental principles of clothing construction.

2 lectures, 3 laboratory hours a week.

25a. **Home Management:** A study of homemaking with special emphasis on the budgeting of time, energy and income; fundamental principles and management involved in the use, care and maintenance of household equipment.

3 hours a week, one semester (half course).

25b. **Family Relations:** A study of the position of woman in the home; a positive program for family problems and their solution in the light of Christian teaching.

3 hours a week, one semester (half course).

27. **Foods:** An elementary study of the selection and preparation of foods; standards for food preparation; practical experience in menu making, food costs, nutritive evaluation, meal preparation, time management and table service for formal and informal meals in the home.

2 lectures, 2 laboratory hours a week.

31. **Nutrition:** Study of the nutritional requirements of the body at different age levels with particular emphasis on their importance to health and prevention of disease; study of the present-day requirements of children, developing satisfactory food habits, causes and recognition of deficiency diseases. Seminar required (see below). (Prerequisite: Home Economics 27, Biology 1 or equivalent.)

3 lectures a week.

37. **Experimental Cookery:** A study of the effects of varying procedures, ingredients and equipment on various food products with emphasis on the methods which will best conserve nutriment, flavor and appearance. Seminar required (see below). (Prerequisite: Home Economics 27).

2 lectures, 3 laboratory hours a week.

Seminar: A study of current findings and problems, assigned readings, and discussion of current literature; field trips. Seminar is required of all students taking Home Economics 31 and 37.

ITALIAN

(See p. 169.)

LATIN

(See p. 135.)

LIBRARY SCIENCE

Use of Books and Libraries: A general course designed to make all students familiar with the classification of the library; to enable them to read a book technically; to use the dictionary catalogue and to interpret catalogue cards; to acquaint them with the basic reference tools which they will need to use during their college years. Seven lectures. (Required of all students entering the University in Preliminary or First Year.)

MATHEMATICS

Officers of instruction: Associate Professors: Rev. D. T. Faught, C.S.B., M.A. (Department Head); H. A. Eliopoulos, M.Sc., Ph.D.; A. C. Smith, M.Sc., Ph.D.; E. Zakon, Dr.jur.; L. L. Campbell, M.S., Ph.D.; Assistant Professors: J. Abramowich, M.A., Ph.D.; L. Artiaga, B.A., M.Sc.; *M. T. Klemola, Ph.D.; Rev. W. F. Nigh, C.S.B., M.A.; S. Verma, M.Sc., Ph.D.; Lecturer: W. Zayachkowski, M.A.; Sessional Instructor: D. J. Foulis, Ph.D.; F. K. Schnitzer, Ph.D.
*On leave of absence.

For major in general science course, see p. 101; for major in general arts course, p. 84; for Honours Mathematics, B.Sc., p. 108; B.A., p. 96; for graduate course, p. 252.

1y. **Algebra:** Functions and their graphs, quadratic equations, ratio and proportion, variation, progressions, interest and annuities, permutations and combinations, binomial theorem, mathematical induction, determinants, complex numbers and sequences.

2 hours a week (half course).

2y. **Analytic Geometry:** The point, straight line, circle, parabola, ellipse, hyperbola, translation and rotation of axes, general second-degree equations, polar coordinates, parametric equations, determinants of the third order.

2 hours a week (half course).

3y. **Plane Trigonometry:** Fundamental formulae, graphical representation of trigonometric functions, solution of trigonometric equations, solution of triangles, logarithms, complex numbers, De Moivres theorem.

2 hours a week (half course).

4a. **Algebra and Plane Trigonometry:** Graphical representation of algebraic functions, solution of linear and quadratic equations, the progressions, ratio and proportion, the mathematics of investment, permutations and combinations, the binomial theorem, selected topics in trigonometry.

3 hours a week, one semester (half course).

4b. **Analytic Geometry and Plane Trigonometry:** A study of the point, straight line, circle, parabola, ellipse, and hyperbola; selected topics in trigonometry.

3 hours a week, one semester (half course).

11. **General Mathematics:** Vector algebra, solid analytical geometry, determinants, matrices, sets, linear programming, polar coordinates, parametric equations, complex numbers, transcendental functions, induction, curve tracing, the general quadratic equation. (Prerequisite: Mathematics 1y, 2y, 3y, or Grade XIII Algebra, Geometry, Trigonometry.)

2 lectures, 2 tutorial hours a week.

15. **Differential and Integral Calculus:** Functions and limits, the derivative, differentiation of algebraic and transcendental functions, definite and indefinite integrals, partial differentiation, applications to problems involving lengths, areas, volumes, and problems in mechanics and physics. (Prerequisite: Mathematics 1y, 2y, 3y.)

3 hours a week.

21. **Fundamental Concepts of Mathematics:** Sources and evaluation of mathematical ideas and methods, sets, algebraic structures, number systems, relations to logic, axiomatic method, the infinite, present-day situation in the foundations.

3 hours a week.

22. **Probability and Statistics:** Elementary set theory and probability, empirical and theoretical frequency distributions of one variable, sampling theory, correlation and regression, goodness of fit, small sample distributions, testing hypotheses and estimation. (Prerequisite: Mathematics 15; corequisite: Mathematics 25.)

3 lectures, 3 laboratory hours a week.

22x. **Probability and Statistics:** Same as Mathematics 22 but without laboratory periods. (Prerequisite: Mathematics 15; corequisite: Mathematics 25).

23. **Mathematical Analysis for the Social Sciences:** Relationships and their graphs, slopes, solutions of equations and inequalities, vectors and matrices, progressions, probability, introductory topics from the differential and integral calculus.

This course is not available to students majoring in matheatics or physical sciences.

2 hours a week.

25a. **Intermediate Calculus:** Improper integrals, infinite series, multiple integration, partial derivatives, line and surface integrals. (Prerequisite: Mathematics 15; prerequisite or corequisite: Mathematics 11.)

4 lectures, 2 tutorial hours a week, one semester (half course).

25ax. **Intermediate Calculus:** Same as Mathematics 25a but without tutorial hours (half course).

25b. **Vector Calculus and Differential Equations:** gradient, divergence and curl with applications; differential equations of first order, higher-order differential equations with constant coefficients, series solutions of differential equations. (Prerequisite: Mathematics 15; prerequisite or corequisite: Mathematics 11.)
4 lectures, 2 tutorial hours a week, one semester (half course).

25bx. **Vector Calculus and Differential Equations:** Same as Mathematics 25b but without tutorial hours. (Half course).

27. **Probability, Complex Variables and Laplace Transformation:** Introduction to the theory of functions of a complex variable, Laplace transformation, probability and statistics. (Prerequisite or corequisite: Mathematics 25.)
2 lectures, 2 tutorial hours a week.

27x. **Methods of Applied Mathematics II:** Same as Mathematics 27 but without laboratory periods. (Discontinued, 1962.)
2 hours a week.

30a. **Vector Analysis:** Applications to geometry, vector calculus, differential geometry of curves, introduction to differential geometry of surfaces, differential operators. (Discontinued, 1962.)
3 hours a week, one semester (half course).

30b. **Theoretical Mechanics:** Kinetics, dynamics of a particle, dynamics of systems, least action principle, Lagrange's equations, introduction to electromagnetic theory. (Prerequisite: Mathematics 11 and 15.) (Discontinued, 1962.)
3 hours a week, one semester (half course).

32a. **Solid Analytical Geometry:** Elements of solid analytical geometry including lines and planes, quadrics, ruled surfaces, transformation to principle axes, and related topics. Corequisite: Mathematics 25.)
3 hours a week, one semester (half course).

32b. **Modern Geometry:** Logical systems, axiomatic geometry, Menelaus' and Ceva's theorems, harmonic elements, projective geometry, non-Euclidean geometrics. (Corequisite: Mathematics 25.)
3 hours a week, one semester (half course).

33a. **Advanced Calculus and Partial Differential Equations:** sequences and series, limits, continuous functions, Fourier series and integrals, derivation of some partial differential equations of physics, solution of these equations by separation of variables. (Prerequisite: Mathematics 25.)
4 lectures, 2 tutorial hours a week, one semester (half course).

33b. **Advanced Calculus and Numerical Analysis:** Integration, series of functions, finite difference formulae, interpolation, numerical integration, numerical solution of equations, principles of automatic computers. Students will practise these methods on desk calculators and on a digital computer in the laboratory hours. (Prerequisite: Mathematics 25.)

4 lectures, 3 laboratory hours a week, one semester (half course).

33. **Advanced Calculus and Applied Mathematics:** Sequences, limits, functions, numerical analysis, Fourier series, partial differential equations. (Prerequisite: Mathematic 25.) (Discontinued, 1962.)

3 lectures, 2 tutorial hours a week.

35a. **Partial Differential Equations:** Fourier series and integrals, derivation of some partial differential equations of physics, solution of these equations by separation of variables. Prerequisite: Mathematics 25).

3 lectures, 2 tutorial hours a week, one semester (half course). (The tutorial hours may be omitted with the consent of the department.)

35b. **Numerical Analysis:** Finite difference formulas, interpolation, numerical integration, numerical solution of equations, principles of automatic computers. Students will practise these methods on desk calculators and on a digital computer in the laboratory hours. (Prerequisite: Mathematics 25.)

3 lectures, 3 laboratory hours a week, one semester (half course).

35. **Methods of Applied Mathematics III:** Fourier series, partial differential equations, numerical analysis. (Prerequisite: Mathematics 25.) (Discontinued, 1962.)

2 lectures, 1 or 2 tutorial hours a week.

35x. **Methods of Applied Mathematics III:** Same as Mathematics 35 but without tutorial hours. (Discontinued, 1962.)

2 hours a week.

37. **Modern Algebra:** Groups, rings, fields, the integers, rational numbers, polynomials, real numbers, complex numbers, group theory, vector spaces, matrices, linear groups, determinants, canonical forms, set theory, Galois theory.

3 hours a week.

39b. **Theory of Numbers:** An introductory course. Properties of integers, divisibility, congruences, Fermat's and Wilson's theorems, primitive roots, quadratic residue, diophantine equations. (Discontinued, 1962).

3 hours a week, one semester (half course).

40. **Applied Mathematics for Engineers:** Several topics selected from among the following: ordinary differential equations, vector analysis, probability, functions of a complex variable, Laplace transformations, Fourier series, partial differential equations, numerical analysis.

2 hours a week.

Honours Courses

221. **Foundations of Mathematics:** Informal set theory and its limitations; propositional calculus; Hilbert arithmetic; the nature and historical origin of mathematical knowledge; the use of logical systems in algebra and geometry.

3 hours a week.

227. **Introduction to Modern Algebra:** Algebraic structures, matrix calculus, vector spaces, linear systems, linear and quadratic forms, eigenvalue problems, linear groups and applications.

3 lectures, 1 tutorial hour a week.

229. **Analytic Geometry and Foundations of Modern Analysis:** Sets, binary relations and mappings, ordered fields, the real number system, metric spaces, sequences, Bolzano-Weierstrass and Heine-Borel theorems, continuous maps, Riemann integration, differentiation, infinite series; vectors, planes and lines in the 3-space, quadric surfaces, linear transformations of the 3-space, general quadratic equation, the n-space, vector spaces in general.

3 lectures, 1 tutorial hour a week.

254a. **Intermediate Calculus:** Sequences, improper integrals, indeterminate forms, infinite series, partial derivatives, line and surface integrals, volume integrals.

4 lectures, 1 tutorial hour a week (1 semester).

254b. **Vector Calculus and Differential Equations:** Gradient, divergence and curl with applications, Green's and Stokes' theorems, differential equations of first order, higher order differential equations with constant coefficients, series solutions of differential equations.

4 lectures, 1 tutorial hour a week (1 semester).

254. **Intermediate and Advanced Calculus:** Approximate integration, improper integrals, indeterminate forms, infinite series, partial derivatives, multiple integrals, line integrals, number systems, Dedekind cuts, sequences, functions, limits, continuity, Fourier series. (Discontinued, 1962.)

4 lectures, 1 tutorial hour a week.

300. **Principles of Analysis:** Point set theory, real numbers (reviewed), sequences of functions, power series, improper, iterated and multiple integrals, Taylor's formula in several variables, iterated and double limits, implicit functions, Fourier series. (Prerequisite: Mathematics 229.)

3 lectures a week.

331. **Probability and Statistics:** Set theory and probability measure, conditional probability, Bayes' theorem, variables and distributions in one and two dimensions, applications.

3 hours a week.

332. **Modern Geometry:** Logical systems, theorem of Menelaus, Ceva and Desargues, cross ratio and coordinate and projective geometry, non-Euclidean and metric projective geometries.

3 hours a week.

338a. **Functions of a Complex Variable:** Fundamental definitions, elementary functions, Cauchy's integral formula, residues and poles, conformal mapping, applications to the evaluation of real integrals and to the solution of some partial differential equations of physics.

3 hours a week, one semester (half course).

338b. **Complex Variables and Laplace Transforms:** Review of theory of functions of a complex variable, introduction to the theory of the Laplace transformation, solution of differential equations by Laplace transform methods. (Prerequisite: Mathematics 338a.)

2 lectures, 2 tutorial hours a week, one semester (half course).

341a. **Vector Analysis and Differential Geometry:** Vector operations in linear geometry, metric vector operations, infinitesimal vector operations, theory of curves and surfaces, Cartan calculus.

3 hours a week, one semester (half course).

341b. **Theoretical Mechanics:** Elementary principles, mechanics of a particle and system of particles, variational principles, Lagrange equations, two-body problem, kinematics of rigid body motion.

3 hours a week, one semester (half course).

354. **Differential Equations:** Elementary methods of solution of ordinary differential equations of the first order and of differential equations of higher order with constant coefficients, existence theorems, theory of linear equations, oscillation theorems, eigenfunctions, solution in infinite series, solution of special second-order partial differential equations, introduction to the use of the Laplace transformaton.

3 hours a week.

400. **General Topology:** Topological spaces, Moore-Smith convergence, homeomorphism, product and quotient spaces, topological groups, embedding and metrization, compact spaces, uniform spaces, function spaces. (Prerequisite: Mathematics 300.)

2 hours a week.

429b. **Synthetic and Analytic Projective Geometry:** Principles of duality, correlation of geometric figures, harmonic ranges, harmonic pencils, Pascal's and Brianchon's theorems, poles and polars, analytic foundations of projective geometry, perspectives, affine and Euclidean geometries from the projective point of view, the classical non-Euclidean geometries, the geometric continuum.

3 hours a week, one semester (half course).

435y. **Numerical Analysis:** Operation of digital computers, interpolation, operations with finite differences, numerical solution of equations, least squares curve fitting, numerical integration of differential equations.

1 hour a week (half course).

437. **Modern Algebra:** Integers, rational numbers and fields, real numbers, polynomials, complex numbers, group theory, vectors and vector spaces, matrices, linear groups, rank and determinants, algebra of classes, transfinite arithmetic, rings and ideals, number fields, Galois theory.

3 hours a week.

438b. Renumbered 338a in 1962.

444. **Theory of Functions of a Real Variable:** Measure and integration, point-set theory, Lebesgue-Stieltjes measures, measurable functions, integration, convergence theorems, Hilbert and Banach spaces.

3 hours a week.

448. **Theory of Functions of a Complex Variable:** Point sets, analytic functions, conformal mapping, integration, infinite series and applications, integral and meromorphic functions.

2 hours a week.

449a. **Modern Differential Geometry:** Differential manifolds, tensor fields, exterior differential calculus, spaces with affine connection, Riemannian spaces, introduction to generalized metric spaces.

3 hours a week, one semester (half course).

449b. **The Theory of Relativity:** Special theory of relativity, relativistic dynamics, electromagnetic fields, retarded and advanced potentials, Lorentz, Dirac and Feynman classical theories, general theory of relativity and introduction of unified field theories.

3 hours a week, one semester (half course).

450a. **Hydromechanics:** Kinematics of motion, the pressure tensor, equations of motion, forces on bodies in fluids, vorticity, potential flow, perfect fluids, viscous fluids, Navier-Stokes equations, laminar flow, gas dynamics.

3 hours a week, one semester (half course).

450b. **Electromagnetism:** Electrostatics, theory of potentials, dielectrics, steady electric currents, magnetism, quasistationary fields, Maxwell's equations, electromagnetic stress tensor and momentum plane waves, radiating dipole.

3 hours a week, one semester (half course).

451. **Advanced Dynamics and Quantum Theory:** (i) The Hamilton equations of motion, canonical transformations, Hamilton-Jacobi theory, the Kepler problem, the Bohr atom, Sommerfeld theory, small oscillations. (ii) Quantum theory: historical introduction; dynamical variables and observables, quantum conditions, equations of motion, elementary applications, perturbation theory, systems of many particles, theory of radiation, applications to atoms and nuclei, relativistic theory of the electron, theory of positrons. (Prerequisite: Mathematics 341.)

3 hours a week.

453. **Methods of Applied Mathematics:** Partial differential equations, special functions of mathematical physics, spectral theory of differential and integral equations, integral transforms, topics from the calculus of variations.

2 hours a week.

MODERN LANGUAGES

Officers of Instruction: Professor: Rev. C. J. Drouillard, C.S.B., Ph.D. (Department Head); Associate Professors: A. A. Thibault, M.A. License-es-Lettres, D.-es-Lettres; Miss Lillian McCarthy, Ph.D.; Assistant Professors: V. Almazan, L.es L.; Rev. J. M. C. O'Donoghue, C.S.B., M.A.; Sr. Pauline of Mary, S.N.J.M., M.A.; Rev. R. S. Pazik, C.S.B., M.A.; Lecturers: Rev. A. J. Weiler, C.S.B., B.A.; Mrs. E. Zakon, M.A.; W. S. Skakoon, M.A.; Sessional Lecturer: Mrs. V. Strandridge, M.H.E.

For major in general course, see p. 84; for Honours English and French p. 88; for Honours English and Spanish, p. 92; for Honours French and Spanish, p. 93; for Honours English and Philosophy (Language option), p. 91.

I. FRENCH

A. **Elementary:** Emphasis is placed on the acquisition of basic reading and writing skills and of oral and aural comprehension. Laboratory work is required of all students.
3 lectures, 2 laboratory hours a week.

2. **Intermediate:** This course is designed to teach the student accurate writing, rapid reading and exact comprehension. Training in the basic skills of aural comprehension and conversation will be given in the laboratory. (Prerequisite: French A or Grade XII French.)
3 lectures, 2 laboratory hours a week.

12. **The Modern French Theatre:** Specified periods of laboratory work. (Prerequisite: French 2 or Grade XIII French.)
3 lectures, 2 laboratory hours a week.

French 12 is prerequisite for all the following courses in French.

21. (Renumbered 37 in 1963).

22y. **Conversation, Phonetics:** Systematic oral practice for those students who wish to develop a fluency in speaking French.
2 lectures, 2 laboratory hours a week (half course).

23y. **Advanced Composition.**
2 hours a week (half course).

27. **French Literature of the Renaissance and Classical Periods:** Study of representative literature of the sixteenth and seventeenth centuries: reading, lectures, discussion and reports.
3 hours a week.

31. **Realism to the present time.** (Prerequisite: French 27, or permission of the Department).
3 hours a week.

37. **Literature of the Eighteenth Century and Romanticism.** (Prerequisite: French 27, or permission of the Department).
3 hours a week.

Honours Courses

260y. **Prose Composition.** I hour a week (half course).

261y. **Conversation, Phonetics.**
1 lecture a week; laboratory hours to be arranged (half course).

270. **French Literature of the Renaissance and Classical Periods:** Study of representative literature of the 16th and 17th centuries; reading, lectures, discussions and reports.
3 hours a week.

375y. **Advanced Prose Composition.**
1 hour a week (half course).

376y. **French Canadian Literature; Criticism.**
1 hour a week (half course).

380. **The Literature of the 18th Century:** Lectures, reading, discussion, reports in French. (Prerequisite: French 27).

490. **The Literature of the 19th Century:** Pre-Romanticism, Romanticism, Naturalism and Symbolism in poetry, the novel and the drama. (Prerequisite: French 380). 3 hours a week.

495. **The Literature of the 20th Century:** Poetry, the Novel and Drama. 3 hours a week.

496y. **Old French.**
1 hour a week (half course).

II. GERMAN

A. **Elementary:** The work of Grade XII or its equivalent is covered. Laboratory periods required. 3 lectures, 2 laboratory hours a week.

2. **Intermediate:** The work of Grade XIII or its equivalent is covered. Laboratory periods required. (Prerequisite: German A or Grade XII German.) 3 lectures, 2 laboratory hours a week.

12. **Advanced:** Readings from selected German authors, grammar, dictation, conversation, laboratory work. (Prerequisite: German 2 or Grade XIII German). 3 lectures, 2 laboratory hours a week.

21. **Outline of Modern German Literature:** Survey of German literature from beginnings to Romanticism. 2 hours a week.

31. **German Literature from 1805 to the Present:** The emphasis will be on the actual reading of a maximum number of poems, short stories, novels and plays in their entirety. These works will be discussed as literature and as products of German culture.

3 hours a week.

III. ITALIAN

A. **Elementary:** Grammar, translation, dictation, oral practice. Laboratory work is required of all students.

3 lectures, 2 laboratory hours a week.

2. **Intermediate:** Grammar, translation, composition, oral practice, laboratory work. (Prerequisite: Italian A or Grade XII Italian).

3 lectures, 2 laboratory hours a week.

12. **Advanced:** Grammar analysis, dictation, translation, reading, introduction to Italian history and literature, conversation. Laboratory work required. (Prerequisite: Italian 2 or Grade XIII Italian.)

3 lectures, 2 laboratory hours a week.

IV. RUSSIAN

A. **Elementary:** Pronunciation, grammar, dictation, translation, oral practice. Laboratory work is required of all students.

3 lectures, 2 laboratory hours a week.

Ax. **Elementary Reading Course:** Pronunciation, writing, grammar, syntax; translation of scientific texts.

3 hours a week.

2. **Intermediate:** Grammar, dictation, translation, composition, conversation. Laboratory work required. (Prerequisite: Russian A.)

3 lectures, 2 laboratory hours a week.

12. **Advanced:** Special problems of grammar, translation, conversation, composition. Laboratory work required. Prerequisite: Russian 2.)

3 lectures, 2 laboratory hours a week.

V. SPANISH

A. **Elementary:** Grammar, translation, dictation, oral practice. Laboratory work is required of all students.
3 lectures, 2 laboratory hours a week.

2. **Intermediate:** Grammar, translation, composition, oral practice, laboratory work. (Prerequisite: Spanish A or Grade XII Spanish.)
3 lectures, 2 laboratory hours a week.

4. **Elementary and Intermediate:** Grammar, translation, dictation, oral practice; laboratory work is required of all students. (This course is intended only for those who have a high proficiency in language and who intend to pursue the Honours course. Others may enter only with approval of the Department Head. Students entering this course from Grade XIII will be permitted to take the Honours courses on approval from their instructor, following the successful completion of Spanish 4.)
5 lectures, 2 laboratory hours a week.

12. **The Spanish novel,** the essay and other didactic literature. (Prerequisite: Spanish 2 or 4 or Grade XIII Spanish).
3 lectures, 2 laboratory hours a week.

21. **Spanish Literature:** Literature of Spain from its origins to 1700. (Discontinued in 1963).

22y. **Conversation:** Systematic oral practice for developing fluency in speaking Spanish, laboratory work.
2 hours a week (half course).

23y. **Advanced Composition.**
2 hours a week (half course).

25. **The Spanish theatre;** main traditions of Spanish poetry.
3 hours a week.

33. **Spanish Literature:** Literature of Spain from 1700 to present time. (Discontinued in 1963).
3 hours a week.

34. **Hispanic Literature:** Literature of Mexico, Central and South America.
3 hours a week.

36. **The great masterpieces:** El Poema del Cid, Alfonso el Sabio, El Conde Lucanor, La Celestina, Don Quijote, the Don Juan Theme.
3 hours a week.

Honours Courses

221. **Spanish Literature:** Literature of Spain from its origins through the Middle Ages, the Renaissance down to the close of the Siglo de Oro. The Humanists. (Prerequisite: Spanish 12). (Discontinued in 1963).

3 hours a week.

222y. **Conversation:** Systematic oral practice for developing fluency in speaking Spanish.

1 lecture a week, laboratory hours to be arranged (half course).

223y. **Advanced Composition.**

1 hour a week (half course).

225. **The Spanish theatre;** main traditions of Spanish poetry. (Prerequisite: Spanish 12).

4 hours a week.

333. **Mexican Literature:** Poetry of the Colonial Period; beginnings of the novel; the Independence; Novel of the Revolution; contemporary theatre.

2 hours a week.

334. **Spanish American Literature:** Modernism and Post-Modernism; the short story; Central and South America.

2 hours a week.

335y. **Comparative Study of Spanish and Portuguese.** (Discontinued in 1963).

1 hour a week (half course).

338y. **Introduction to Romance Philology.**

1 hour a week (half course).

432. **Spanish Literature:** The 18th and 19th centuries; Neo-Classicism, Romanticism, the regional novel.

3 hours a week.

433. **Spanish Literature:** Generation of 1898 to post-Civil War and contemporary.

2 hours a week.

435y. **Comparative Study of Spanish and Italian.** (Discontinued in 1963).

1 hour a week (half course).

436. **The great masterpieces:** El Poema del Cid, Alfonso el Sabio, El Conde Lucanor, La Celestina.

2 hours a week.

437. **The great masterpieces:** Don Quijote, The Don Juan Theme.

2 hours a week.

438y. **History of the Spanish Language.**

1 hour a week (half course).

MUSIC

Lecturer: Rev. J. J. Fiore, C.S.B., B.A., S.T.B.; Instructor: Violet Webb Leach, L.C.M., C. of M., M.A.; Artist on Campus. Matteo Glinski.

1. **First Course:** Any two of the following three sections:

(1) (a) History: The Classic period commencing with the life of Bach and Handel, and including music and life and times of Haydn, Gluck, Mozart and Beethoven. (b) Form: A knowledge of the musical sentences, cadences and sonata form based on the work of Haydn, Mozart and Beethoven.

(2) Elementary Rudiments and Harmony: A knowledge of major and minor scales, intervals, embellishments, dominant seventh chords and their inversions, and the use of primary and secondary chords and cadences.

(3) Applied Music: Public performance, or examination.

3 hours a week.

11. **Second Course:** Any two of the following three sections:

(1) (a) History: A knowledge of the music and lives of the composers of the nineteenth century, including von Weber, Schubert, Schumann, Chopin, Liszt, Berlioz, Wagner, Brahms, and the Russians. (b) Form: Continuance of sonata form, the suites, rondo, fugue and dance forms, etc.

(2) Harmony: (a) adding three parts above a figured bass; (b) harmonizing a melody in four parts or adding a bass to a given melody using passing and auxiliary notes.

(3) Applied Music: Similar stipulations to the first year but of correspondingly more advanced character. (Prerequisite: Music 1 or equivalent.)

3 hours a week.

NURSING

Officers of Instruction: Assistant Professor: Miss Florence M. Roach, R.R.C., B.S., Reg.N. (Department Head); Lecturer: Miss Leta G. Sanders, B.S., M.A. (Education), Reg.N.; Instructor: Miss Ruth A. Ingram, B.Sc.N. (P.H.N.), M.N. (N.Ed. and P.H.N.), Reg.N.

For Nursing programs, see p. 115 ff.

1a. **Modern Concept of Health:** General consideration of the universally accepted concepts of health as a foundation for understanding deviations from normal; the prevention of illness relative to both the individual and the community.

2 hours a week, one semester (half course).

10a. **Orientation to Nursing:** The introduction of the beginning student to the modern concept of nursing in its broad field; to the patient as a person; to her individual role as part of the patient's therapy, and, as a contributing member of the health team; the value of the nurse-citizen to the community.

3 hours a week, one semester (half course).

16b. **Nurse-Patient Relationship:** Interpretation of the nurse as part of the patient's therapy; her role as a member of the health team giving supportive comprehensive nursing care to the patient; preventive and rehabilitative aspects of nursing. (For Registered Nurses).

2 hours a week, one semester (half course).

30a. **Fundamentals of Administration:** Principles and elements of administration of nursing service; the role and functions of the clinical supervisor and head nurse.

3 hours a week, one semester (half course).

30b. **Ward Administration and Supervision:** Tools and techniques; team nursing; newer concepts in nursing care; communication; evaluation; analysis of problems in the work situation.

3 hours a week, one semester (half course).

31. **Teaching in Schools of Nursing:** Qualifications; methods; curriculum; planning course and lesson content; evaluation techniques.

3 hours a week.

32b. **Trends and Developments in Nursing:** A broad concept of what is involved in the practice of professional nursing; the professional nursing organizations; factors influencing past development as well as present and future trends; consideration of research, study reports.

2 hours a week, one semester (half course).

33a. **Community Health Nursing:** Trends in public health practices necessary for the protection and promotion of individual health; community health facilities, their organization and function; the integration of social and health aspects in the basic nursing curriculum.

2 hours a week, one semester (half course).

33y. **Seminar Course in Nursing:** Trends and developments in nursing; survey of current literature, studies and reports, and their implication. (Prerequisite: Nursing 30.)

1 hour a week (half course).

34. **Principles and Practices of Community Health Nursing:** Philosophy, goals and function of community health nursing; integration of social and related public health principles to promote the physical and mental well being of the individual as a member of family and society, consideration of health needs in growth and development from birth to senescence, in terms of modern health concepts.

4 hours a week.

35. **Preventive Medicine and Health Supervision:** Trends in public health practices; organization, administration and legislation for health maintenance from the international to the community level; epidemiological, statistical and nutritional concepts; environmental sanitation and safety; health education and civil defence.

3 hours a week.

36b. **Financial Administration of a Hospital Nursing Service Department:** Principles and procedures of financial administration and budgeting.

2 hours a week, one semester (half course).

37. **Nursing Administration:** Planning and operation of the department of nursing service and the school of nursing; physical features; staffing; personnel policies and services; medico-legal factors. (Prerequisite: Nursing 30 or equivalent.)

2 hours a week.

38. **Nursing Administration:** This follows the general pattern of Nursing 37 but is on an advanced level and students must complete, under direction, a comprehensive study related to their specialty field. (Prerequisite: Nursing 30 or equivalent.)

3 hours a week in first semester and 2 hours a week in second semester.

39b. **Occupational Health Services:** Historical, social and economic aspects of occupational health; preventive principles and methods in relation to the worker and his environment; analysis and evaluation of the professional responsibility of the occupational health nurse in health programs for employee groups.

1 hour a week, one semester (half course).

PHILOSOPHY

Officers of Instruction for the University: Associate Professors: P. F. Flood, M.A. (Department Head); Rev. E. B. Allen, C.S.B., M.S.L., Ph.D.; Assistant Professors: J. N. Deck, Ph.D.; J. M. Graham, Ph.D.; R. C. Nelson, Ph.D.; Lecturers: J. Brown, M.A.; J. Catan, M.A.; S. B. Cunningham, M.A.; Rev. J. Daley, C.S.B., M.A., S.T.B.; H. C. de Alvarez, M.A.; Special Lecturer: Rev. N. J. Ruth, C.S.B., M.A.; **for Canterbury College:** Professor: Rev. F. T. Kingston, B.D., M.A., D.Phil.; Lecturer: Rev. P. F. F. Wilkinson, M.A., L.Th.; **for Holy Redeemer College:** Assistant Professors: Rev. A. E. Alexander, C.Ss.R., Ph.L.; Rev. R. D. Powers, C.Ss.R., M.A.; Lecturer: Rev. T. I. Kelly, C.Ss.R., S.T.L.

For major in general course, see p. 84; for Honours English Philosophy (Philosophy option), see p. 90; for Honours English and Philosophy (Language option), p. 91; for Honours History (Philosophy option), p. 95; for Honours Philosophy (Science options), p. 97; for Honours Philosophy and Psychology, p. 98; for graduate courses, p. 243.

15. **Introduction to Western Philosophy:** Philosophy as seen through its history and current applications; the development and resolution of selected philosophical problems in the Western tradition with readings from ancient, modern, and contemporary philosophers.

3 hours a week.

Philosophy 15 is prerequisite for all other Philosophy courses; Philosophy 22 may not be taken as part of the major.

21a. **Logic:** The logical operations, simple apprehension, judgment and reasoning; their use in the sciences and in infra-scientific cognition. The epistemological analysis of logic.

3 hours a week, one semester (half course).

22. **Ethics:** The principles of moral philosophy.

2 hours a week.

24. **Greek Philosophy:** A study of Greek philosophers from the Ionians to the Neo-Platonists. Readings in original and secondary source material.

3 hours a week.

25a. **Philosophy of Nature and of the Sciences:** Philosophic analysis of change; causality and finality in nature; the philosophy of man; speculative and practical intellect; the degrees of knowledge; the epistemology of art and of the physical and social sciences.

3 hours a week, one semester (half course).

25b. **Social Philosophy:** The nature and function of society. Political, economic, educational and religious societies. Contemporary social problems. The relationship between philosophy and the social sciences.

3 hours a week, one semester (half course).

26b. **Philosophy of Education:** The purposes of education. The levels of education; the art of education. Contemporary and perennial problems of education.
3 hours a week, one semester (half course).

27. **Mediaeval Philosophy:** The Greek origins; the development, flowering and decline of mediaeval philosophy.
3 hours a week.

28. **Philosophical Psychology:** The detailed analysis of human behaviour presented historically and systematically; human powers. Affective psychology: human emotions; love, its cause and effects; the nature of man; contemporary philosophic anthropologies. (Expanded to full course in 1963).
3 hours a week.

31. **Modern and Contemporary Philosophy:** A study of modern philosophers from Francis Bacon to the present.
3 hours a week.

33a. **Pragmatism:** American pragmatism. Peirce, James, Schiller and Dewey.
3 hours a week, one semester (half course).

33b. **Phenomenology:** The history and appraisal of the phenomenological movement from Brentano and Stumpf to the present.
3 hours a week; one semester (half course).

34. **Metaphysics:** The philosophy of being. The historical background. Analogy, participation, causality. The existence of God; the divine attributes. The One, the Good, the True, the Beautiful. The metaphysics of knowledge, epistemology.
3 hours a week.

35a. **Analysis:** Logical Positivism; Logical Empiricism; Semantics; Linguistic Analysis: An historical and doctrinal study.
3 hours a week, one semester (half course).

35b. **Symbolic Logic:** A brief introduction to symbolic logic.
3 hours a week, one semester (half course).

36a. **Existentialism:** The phenomenological background, Husserl.
2 hours a week, one semester (half course).

36b. **Existentialism:** The influence of existentialism on contemporary literature, art, psychology, politics and theology.
2 hours a week, one semester (half course).

39. The Philosophy of Law and Politics: An historical and philosophical analysis of law; natural and positive law; law and right; freedom and authority; juridical institutions.

2 hours a week.

Honours Courses

221a. Logic: The logical operations, simple apprehension, judgment and reasoning; their uses in the sciences and in infra-scientific cognition. Comparison of Aristotelian and modern logics. The epistemological analysis of logic.

3 hours a week, one semester (half course).

222. Ethics: The relationships among moral philosophy, prudence and moral theology. The principles of moral philosophy.

2 hours a week.

224. Greek Philosophy: A study of Greek Philosophers from the Ionians to the Neo-Platonists. Readings from the Pre-Socratics, Plato, Aristotle, Plotinus and Proclus.

2 lectures, 1 seminar a week.

226b. Philosophy of Education: The nature of the Philosophy of Education; the metaphysical, epistemological and psychological bases of education. The levels of education. The art of education; problems in contemporary education.

3 hours a week, one semester (half course).

228. Philosophical Psychology: The philosophic analysis of human behaviour, powers and nature, presented through readings in Plato, Artistotle, St. Augustine, St. Thomas, Descartes, Kant, etc. (Expanded to full course in 1963).

2 lectures, 1 seminar a week.

327. Mediaeval Philosophy: The Greek origins; the development, flowering and decline of mediaeval philosophy. Readings from St. Augustine, Boethius, Scotus Erigena, St. Tnselm, Abelard, Maimonides, St. Bonaventure, St. Thomas, John Duns Scotus and William of Occam.

2 lectures, 1 seminar a week.

333a. Pragmatism: American pragmatism, Peirce, James, Schiller and Dewey. Readings and seminars.

3 hours a week, one semester (half course).

333b. Phenomenology: The history and appraisal of the phenomenological movement from its beginnings to the present. An investigation of the writings of Brentano, Stumpf, Husserl, Pfander, Scheler, and others.

2 lectures, 1 seminar a week, one semester (half course).

334. **Metaphysics:** The philosophy of being. The historical background; Plato, Aristotle. The Arabians, mediaeval Christian philosophy, Suarez, Descartes, Wolff, Kant. Analogy, participation, causality. The existence of God; the divine attributes. The One, the True, the Good, the Beautiful. The metaphysics of knowledge, epistemology.
3 hours a week.

336a. **Existentialism:** The phenomenological background, Husserl. Readings from Kierkegaard, Nietzsche, Heidegger, Jaspers, Sartre, Marcel.
2 hours a week, one semester (half course).

336b. **Existentialism:** The influence of existentialism on contemporary literature, art, psychology, politics and theology. Readings from Gilson, Maritain and Mascall.
2 hours a week, one semester (half course).

411. **Philosophy of the Sciences:** An examination of selected readings in the philosophy of the sciences. (Prerequisite: Philosophy 25a.)
2 lectures, 1 seminar a week.

423b. Renumbered 432b in 1963.

431. **Modern and Contemporary Philosophy:** A study of modern philosophers from Francis Bacon to the present.
2 lectures, 1 seminar a week.

432b. **Philosophy of Art:** Art and the beautiful; art and prudence. Classification of the arts.
3 hours a week, one semester (half course).

435a. **Analysis:** Logical Positivism: Logical Empiricism; Semantics; Linguistic Analysis. Readings and Seminars.
3 hours a week, one semester (half course).

435b. **Symbolic Logic:** A brief introduction to symbolic logic.
3 hours a week, one semester (half course).

439. **The Philosophy of Law and Politics:** An historical and philosophical analysis of law; natural and positive law; law and right; freedom and authority; juridical institutions. Readings and Seminars.
2 hours a week.

447. **Incorporeal Substances:** Historical and systematic study of incorporeal substances.The operations, powers, nature and purpose of incorporeal substances.
2 hours a week.

PHYSICS

Officers of Instruction: Associate Professor: L. Krause, B.Sc., M.A., Ph.D., A.Inst.P. (Head); Assistant Professors: E. E. Habib, B.Sc., Ph.D.; N. E. Hedgecock, M.A., Ph.D.; F. Holuj, M.Sc., Ph.D.; J. Huschilt, M.A., Ph.D.; R. A. Moore, M.Sc., Ph.D.; T. D. Nainan, M.Sc., Ph.D.; A. van Wijngaarden, B.Sc., Ph.D.; Lecturers: I. H. Brockman, B.E., M.Sc.; N. R. C. Postdoctorate Fellow: A. G. A. Rae, B.Sc., Ph.D.

For general course with major in Physics, see p. 101; for Honours Chemistry and Physics, p. 106; for Honours Mathematics and Physics, p. 110; for graduate courses, p. 253.

1. **Basic Physics:** (Prerequisite: Grade XII Physics, co-requisite: Mathematics 4a and b or 1y and 2y).
2 lectures a week for the whole year, 3 laboratory hours a week for one term.

1a. **Basic Physics:** Content same as Physics I.
3 lectures and 3 lab hours a week for 1 semester. (Discontinued in 1962).

10. **Mechanics, Wave Motion and Heat:** Statics and dynamics of a rigid body, properties of solids and liquids, wave phenomena, fundamental concepts in heat, kinetic theory of gases, the first and second laws of thermodynamics. (Prerequisite: Grade XIII Physics or equivalent; corequisite: Mathematics 15).
3 lectures, 3 laboratory hours a week.

12. **Mechanics, Heat and Sound:** The content is similar to Physics 10, but extends for one term only.
4 lectures, 3 laboratory hours a week, one semester.

13. **General Physics:** Mechanics, properties of matter, heat and sound, light, magnetism, electricity and modern Physics. Emphasis is placed on an understanding of fundamental principles and their applications with frequent reference to Biology and Medicine. (Prerequisite: Physics 1a or Grade XIII Physics.)
3 lectures, 3 laboratory hours a week.

15. **Optics, Electricity and Magnetism:** Nature and propagation of light, reflection and refraction at plane and spherical surfaces, thin lenses and their aberrations, optical instruments, polarization, interference and diffraction. Fields of stationary and moving charges, Ohm's law, Kirchhoff's laws, induced electromotive force, elementary A.C. theory, instruments. (Prerequisite: Grade XIII Physics or equivalent; co-requisite: Mathematics 15).
4 lectures, 3 laboratory hours a week, one semester.

22. **Light:** Elements of geometrical and physical optics. (Co-requisite: Mathematics 25x or equivalent).
3 lectures, 3 laboratory hours a week.

23. **Electricity and Magnetism:** Fields of stationary and moving charges, Ohm's law, Kirchhoff's laws, induced electromotive force, elementary A.C. theory, instruments. (Corequisite: Mathematics 25x or equivalent).

3 lectures, 3 laboratory hours a week.

26. **Optics, Electricity and Magnetism:** An elementary treatment of geometrical optics, physical optics, electrostatics, D.C. and A.C. circuit theory and magnetism. (Prerequisites: Physics 10 and Mathematics 15, or equivalent).

3 lectures, 3 laboratory hours a week.

27. **Introduction to Thermodynamics:** Temperature scales, thermodynamic systems, heat transfer, first and second laws, equations of state, Carnot cycle, entropy and Kelvin temperature scale, thermodynamic functions, applications, and kinetic theory. (Prerequisite: Physics 12. Corequisite: Mathematics 25ax, 25bx.) (Discontinued, 1962.)

2 lectures a week, 3 laboratory hours every other week.

27x. **Introduction to Thermodynamics:** The same content as Physics 27 but without laboratory periods. (Prerequisite: Physics 12. Corequisite: Mathematics 25ax, 25bx) (Discontinued, 1962.)

2 lectures a week.

31. **Thermodynamics:** A course at the intermediate level. (Prerequisite: Physics 10, Mathematics 25x, or equivalent.)

2 lectures, 3 laboratory hours a week.

34. **Electronics.** Prerequisites: Physics 26 and Mathematics 25x or equivalent.)

2 lectures, 3 laboratory hours a week.

36. **Modern Physics:** A review of the properties of electrons, atoms and nuclei. An introduction to statistical mechanics and the properties of solids. (Prerequisites: Mathematics 25x and Physics 26 or equivalent.)

2 lectures, 3 laboratory hours a week.

36x. **Modern Physics:** Content the same as for Physics 36, but without laboratory periods. (Prerequisites: Mathematics 25x or equivalent; Physics 15 or equivalent.)

2 lectures a week.

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46. **Contemporary Physics and the Universe:** An outline is given of the aims, methods and conclusions of the physicist, with special reference to the recent theories about the behaviour of matter on the atomic and sub atomic as well as on the cosmic scale. The course is designed for students in their final year of a B.A. course and for graduates. (Prerequisites: Grade XIII Mathematics or equivalent and consent of the instructor.)

2 lectures a week.

Honours Courses

222. **Optics:** Reflection and refraction of light at plane and curved surfaces, properties of mirrors, prisms and lenses, optical instruments. Interference, diffraction and polarization of light. Introduction to Maxwell's electromagnetic field equations. (Co-requisite: Mathematics 25ax and 25bx or equivalent).

3 lectures, 3 laboratory hours a week.

223. **Electricity and Magnetism:** Theory of the electric field and potential with applications to the properties of dielectrics. D.C. and A.C. theory, circuits and instruments. Magnetic phenomena. Introduction to Maxwell's electromagnetic field equations. (Co-requisite: Mathematics 25ax and 25bx or equivalent.)

3 lectures, 3 laboratory hours a week.

331. **Thermodynamics and Statistical Mechanics:** The nature of heat, the first, second and third laws of thermodynamics, equations of state, Maxwell's equations and applications of thermodynamics to the properties of matter. The statistical interpretation of thermodynamics, the perfect gas, elementary theory of transport processes, Boltzmann, Fermi and Bose distributions. (Prerequisite: Physics 10 and Mathematics 25x or equivalent.)

2 lectures a week.

334. **Electronics:** Thermionic emission and impurity conduction in semiconductors, the properties of vacuum tubes and transistors, rectifiers, amplifiers and oscillators, the general theory of feedback systems. Transmission lines, special circuits, including wide band amplifiers, trigger circuits, multivibrators, discriminators, etc. (Prerequisites: Physics 223 and Mathematics 25x or equivalent.)

2 lectures a week.

336. **Modern Physics:** A selection of topics will be presented, including the atomic properties of matter, the conduction of electricity through gases, the quantum theory, atomic and nuclear structure, the special theory of relativity. (Prerequisite: Physics 222, 223, Mathematics 25x or equivalent).

2 lectures a week.

350. **Theoretical Physics I:** Analytical mechanics of particles, systems of particles and rigid bodies. Introduction to mechanics of continous media. Generalized coordinates, Lagrangian and Hamiltonian methods for conservative systems. The special theory of relativity. (Corequisite: Mathematics 35a.)

3 lectures a week.

370. **Junior Physics Laboratory:** May be taken in whole or in part by students attending Physics 331, 334, or 336. (Physics 370/1 indicates one third of the laboratory work, or 2 hours; Physics 370/2 indicates two-thirds, or 4 hours). (Prerequisite: Physics 222, 223, or equivalent.)

6 laboratory hours a week.

450. **Theoretical Physics II:** The classical theory of fields with special reference to: electromagnetic waves in dielectrics and conductors, Herz electric and magnetic vectors, multiple fields, Lenard Wiechert potentials, accelerated charges, Maxwell's electromagnetic stress tensor, relativity. (Prerequisites: Physics 223, Mathematics 35a or equivalent.)

2 lectures a week.

451. **Mathematical Methods in Physics:** Partial differential equations of mathematical physics, special functions, applications of complex variable to Fourier and Laplace transforms.

2 hours a week.

452. **Physical Optics:** A treatment of interference, diffraction, polarization and scattering of light is presented at an advanced undergraduate level. The theory of atomic spectra is also discussed. (Prerequisites: Physics 222, 336, Mathematics 35a or equivalent.)

2 lectures a week.

453a. **Classical Mechanics:** The conceptual structure of Newtonian mechanics, Lagrange's and Hamilton's Equations, canonical transformations and the Hamilton-Jacobi Theory. This course may be taken for graduate credit. (Prerequisites: Physics 350, Mathematics 35a or equivalent.)

3 lectures a week, one semester (half course).

453b. **Introduction to Quantum Mechanics:** The paradoxes of classical physics, DeBroglie waves, the indeterminacy principle. The Schroedinger equation and its application to some one dimensional problems, the simple harmonic oscillator and the hydrogen

atom. The Born approximation and perturbation theory. This course may be taken for graduate credit. (Prerequisites: Physics 336, 453a.)

3 lectures a week, one semester (half course).

466a. **Solid State Physics:** General properties of solids, electrical and thermal conductivity, specific heats and lattice vibrations, semiconductors. (Prerequisites: Physics 331 and 336, Mathematics 35a or equivalent.)

2 lectures a week, 1st semester (half course).

466b. **Nuclear Physics:** The interaction of radiation with matter. Radiation detectors. Nuclear disintegration processes including alpha and beta decay, radiative transitions and fission. Nuclear reactions and nuclear models. (Prerequisites: Physics 336, Mathematics 35a or equivalent.)

2 lectures a week; 2nd semester (half course).

470. **Senior Physics Laboratory:** May be taken in whole or in part by students attending Physics courses bearing numbers above 400. (Physics 470/1 indicates one third of the laboratory work, or 3 hours; Physics 470/2 indicates two-thirds, or 6 hours.) (Prerequisite: Physics 370 or equivalent.)

9 laboratory hours a week.

POLITICAL SCIENCE

(See p. 143.)

PSYCHOLOGY

Officers of Instruction: Associate Professors: Rev. R. C. Fehr, C.S.B., Ph.D., (Department Head); Rev. J. A. Malone, C.S.B., Ph.D.; Rev. M. A. Record, C.S.B., M.A.; A. A. Smith, Ph.D.; V.B. Cervin, Ph.D.; Professor Emeritus: Brother R. Philip, F.S.C., Ph.D.; Visiting Professor: Sr. Marian Dolores, S.N.J.M., Ph.D.; Assistant Professor: Rev. T. J. McGouey, C.S.B., B.A.; Lecturer: M. Starr, M.A.; Research Associate and Lecturer: A. Ortiz, B.Sc., M.D.

For major in general course, see p. 84; for Honours Psychology, p. 99; for Honours Psychology and Science, p. 100; for Honours Philosophy and Psychology, p. 98; for graduate courses, p. 244.

15. **Introduction to Psychology:** A general orientation to Psychology from the scientific viewpoint:
3 hours a week.

Psychology 15 is a prerequisite for all other courses in Psychology, except Psychology 21 and 35a.

21. **Psychology of Adjustment:** This course is designed to present the student with an orientation to the place of psychology in the life of the individual, of the family and of society. Emphasis is placed upon principles of mental hygiene, the parent child interaction, and interpersonal relationships.
2 hours a week.

22. **Child and Adolescent Psychology:** The growth and development of the child and the adolescent.
3 hours a week.

26a. **Educational Psychology:** Psychology of the learning processes; motivation; dynamics of social learning; classroom techniques.
3 hours a week, one semester (half course).

26b. **Educational Psychology:** Counselling and guidance in the school situation: application of the principles of psychological measurement to academic and vocational guidance; mental health in the classroom.
3 hours a week, one semester (half course).

28. **Statistical Methods in Psychology:** Basic principles and methods in the application of statistics to psychological problems.

3 hours a week.

31. **Abnormal Psychology:** Concepts of and criteria of abnormality, mental deficiency, neurosis, psychoses and psychopathy. Discussion of the main theories of abnormality.

3 hours a week.

33a. **Psychology of Perception:** Theories of perception and relevant research; perception as related to other areas of psychology particularly cognition, learning, attitudes and personality.

3 hours a week, one semester (half course).

34. **Social Psychology:** A study of man as a psychological unit of society. Language, learning, leadership, propaganda, competition, culture, conflict, etc., are studied as areas of social interaction.

3 hours a week.

35a. **Human Engineering:** An introduction to the use of psychological principles required in the design of man-machine systems. The purpose of the course is to acquaint the student with the kinds of "human design parameters" needed, and with the sources of pertinent data.

3 hours a week, one semester (half course).

Honours Courses

Honours courses, assigned at the discretion of the Department Head, may form part or all of the requirements for the first year of the two year program leading to the degree of Master of Arts.

222. **Child and Adolescent Psychology:** The growth and development of the child and the adolescent. Special reading in theory and research of development including works of Gesell, Piagt, Freud, Montessori. Six hours observation and analysis of psychological testing of children.

226a. Renumbered 326a in 1963.

228. **Statistical Methods:** Principles and methods relating to psychology and education; tests of significance.
3 hours a week.

230. **Experimental Psychology:** Introduction to laboratory methods and interpretation of results. Principles of experimental design. The carrying out of a short original project.
2 lectures, 2 laboratory hours a week.

231. **Abnormal Psychology:** Concepts of and criteria of the normal and abnormal. A consideration of the organic and psychological sources of mental illness with special emphasis on the etiology, symptoms and dynamics of neuroses, psychoses and psychopathies.
3 hours a week.

233a. **Applied Psychology:** The application of psychological principles to problems in industry and in other fields of human activity. (Discontinued, 1961.)
3 hours a week, one semester (half course).

233b. Renumbered 333b in 1963.

326a. **Educational Psychology:** Growth and development; learning, problem solving, imagination, individual differences, motivation, personality and mental hygiene of school children.
3 hours a week, one semester (half course).

327. **Psychological Tests and Measurements:** Theoretical bases of test construction; study of tests used in measuring intelligence and personality; practice in the administration and evaluation of tests.
3 hours a week.

329. Renumbered 429 in 1963.

330. Renumbered 230 in 1963.

333b. **Physiological Psychology:** A detailed study of the nervous systems in their relation to psychological functions. Recent findings of the effect of the endocrine glands on behaviour. An evaluation of drug therapy in the treatment of mental illness.

3 hours a week, one semester (half course).

334. **Social Psychology:** A study of man as a psychological unit of society. Language, learning, leadership, propaganda, competition, culture, conflict, etc., are studied as areas of social interaction. Honours students will be required to carry out a social study project in addition to their regular assignments.

3 hours a week.

353. **Learning:** A study of the basic principles and experimental evidence of individual and social learning and conditioning. Factors responsible for changes in and maintenance of emotional, motor and symbolic behaviour.

3 hours a week.

429. **Personality:** A study of the theories of trait organization and the development and assessment of personality, with emphasis on individual differences. Ideas, values, attitudes and motives are considered. A special experimental study of trait relationship is undertaken by each student.

3 hours a week.

450. **Projective Techniques:** An introductory course in Rorshach, Thematic Apperception Test, and the House-Tree-Person test. Stress is placed on the Rorschach.

3 hours a week.

451. **Advanced Statistics:** Tests of significance, non-parametric tests and analysis of variance.

3 hours a week.

452. **Emotions:** A study of the physiological basis of emotion and the more recent investigations in this area. A historical study of the development of theories of emotion and motivation. (Prerequisite: Psychology 33b.)

3 hours a week.

453. Renumbered 353 in 1963.

454. **Industrial Psychology:** A study of the principles and techniques of personnel relations, managerial decision-making, and human interaction in industry.

3 hours a week.

RELIGIOUS KNOWLEDGE

Offered by Assumption University and Holy Redeemer College

Officers of Instruction: Professor: Rev. L. A. McCann, C.S.B., S.T.D. (Department Head); Associate Professor: Rev. D. L. Egan, C.Ss.R., S.T.L.,; Assistant Professors: Rev. E. J. Crowley, C.Ss.R., S.S.L.; Rev. J. C. Murray, C.S.B., S.T.D.; Lecturer: Rev. J. J. Fiore, C.S.B., B.A., S.T.B.

For major in general course, see p. 84. Students taking a major in Religious Knowledge or a combined major in Religious Knowledge and another subject are urged to take one or more of the following options: Philosophy 22, 27, 34; History 11.

14a. **Sacred Scripture:** Introduction to the Bible; inspiration; literary forms. Old Testament studies; the Covenant, the Psalms. New Testament studies: the Good News of Christ.
2 hours a week, one semester (half course).

14b. **Liturgy:** The Liturgical Movement, the organic Church, the priesthood of Christ and the laity, the historical development of the Christian act of worship, the Divine Office, the liturgical year.
2 hours a week, one semester (half course).

15. **Revelation: God:** The sources of revelation; the existence of God; the nature of God; the Divine attributes; the Divine operation; the Blessed Trinity.
2 hours a week.

22a. **Christology:** The last three years of the life of Christ, with an outline of the apposite historical setting and background. The personality of Christ as displayed in His works and teachings.
2 hours a week, one semester (half course).

22b. **Mariology:** The development of Marian doctrine.
2 hours a week, one semester (half course).

24a. **Catholic Dogma:** Sources and nature of Theology. The Infinite Spirit; the Blessed Trinity; the Incarnation; the Redemption.
2 hours a week, one semester (half course).

24b. **The Creation, Fall and Restoration of Man:** Man's elevation; original sin; grace, the habits and virtues.
2 hours a week, one semester (half course).

33a. **Apologetics:** Validation of Christianity's claims.
3 hours a week, one semester (half course).

33b. **Great Minds of the Early Church:** Introduction to the Fathers of the Church.
3 hours a week, one semester (half course).

34a. **The Church:** Notion, structure and development of the Mystical Body of Christ.
2 hours a week, one semester (half course).

34b. **Sacramental and Moral Theology:** The sacraments; contemporary moral problems; the layman in the Church.
2 hours a week, one semester (half course).

Offered by Canterbury College

Officers of Instruction: Professor: Rev. Canon R. S. Rayson, M.A., S.T.B., D.D. (Department Head); Lecturer: Rev. F. T. Kingston, M.A., B.D., D.Phil.; Rev. H. G. Hill, O.G.S., M.A.; Rev. P. F. Wilkinson, M.A., L.Th.

C10. **The Basis of Christian Belief:** Revelation, Reason and Faith; the use of Scripture, reason and tradition. The great doctrines of Christendom as contained in the Apostles', Nicene and Athanasian Creeds.
2 hours a week.

C20. **The Principles of Christian Conduct:** The moral law, cardinal and theological virtues, and notable duties. Habitual and actual grace, prayer, and the Sacraments. Specific problems such as betting and gambling, divorce, and temperance, and the application of Christian standards to industry, commerce, labour and politics. Seminars and essays will be required.
2 hours a week.

C26a. Renumbered C36a in 1963.

C26b. Renumbered C36b in 1963

C30. **The Christian Doctrine of God:** His existence and attributes; creation; analogy and the problem of theological language. The Blessed Trinity; the Person of Christ; the Person of the Holy Spirit. Readings in selected texts of the Church Fathers.

2 hours a week.

C36a. **Introduction to Biblical Studies:** Introductory survey of the Bible, its inspiration, historical background, and use in the Church. The modern approach to Biblical studies and the function of Biblical criticism. Development of the Canon of the Old Testament and introduction to its language and literature, with attention to its literary forms. One book of the Old Testament will be studied in some detail.

2 hours a week, first semester (half course).

C36b. **Introduction to the New Testament:** The historical background of the Apostolic Church: oral and written tradition: the development of the New Testament Canon: the language, text, and literature of the New Testament, with intensive study of one of the Gospels and one of the Epistles. The history of the English Bible from Caedmon to the New English Bible. The Bible in the world today. (Prerequisite: Religious Knowledge C26a).

2 hours a week, second semester (half course).

RUSSIAN

(See p. 169.)

SOCIOLOGY AND ANTHROPOLOGY

Assistant Professor: R. A. Helling, B.A. Dipl.-Sozialwirt, Ph.D.; Department Head; Lecturer: D. R. Cole, M.A.; Sessional Instructor: R. A. Waterman, Ph.D.

I. SOCIOLOGY

For major in general course, see p. 84.

11a. **Introduction to Sociology:** The concepts and methods of sociology; forms of social organization; problems of the modern community. Not open to majors.

2 hours a week, one semester (half course).

12. **Introduction to Sociology:** The study of social organization and the social process; the analysis of group life, social contacts, interaction, social forces, conflicts, accommodation, assimilation, amalgamation, and methods of social control.

3 hours a week.

23. **Social Problems:** The study of personality disorganization and maladjustment from the point of view of sociology; the problems of poverty, physical and mental deficiency, alcoholism; insanity, delinquency and crime; social change and social disorganization, the pathology of social groups and classes, the pathology of economic and cultural relations.

3 hours a week.

25a. **Intergroup Relations:** Current trends and programs in treatment of intergroup and intercultural problems. Community resources, agencies, and programs dealing with intergroup problems.

3 hours a week, one semester (half course).

25b. **Criminology:** A study of the theories of causation of crime and the treatment of the convicted adult offender with reference to the history and philosophy of punishment, the operation of prison systems and probation and parole.

3 hours a week, one semester (half course).

27. **Introduction to Social Work:** Historical background and development of the principles of social service; analysis of the methods of case work, group work and community organization.

29. **Urban Community:** Form and development of the urban community. Study of the demographic structure, the functional organization of a heterogeneous society. Special emphasis is put on the industrial community. Study of the means of control and social planning. Study of the rehabilitation and conservation of changing neighbourhoods.

2 hours a week.

32. Renumbered 29 in 1963.

35. **The Development of Sociological Theory:** European and American social theory.

3 hours a week.

37. **Social Research:** Methods of research and their application in the analysis of social phenomena. Emphasis is given to the formulation of research problems, the selection of samples, the methods of data collection and alternate forms of statistical analysis.

3 hours a week.

Honours Courses

229. **Urban Community:** Form and development of the urban community. Social planning for urban redevelopment. Study of social patterns in the city. Urban rehabilitation and neighbourhood conservation. A comparative evaluation of different functional designs of cities.

3 hours a week.

332. Renumbered 229 in 1963.

335. **The Development of Sociological Theory:** European and American social theory. Pioneers of sociology, contributions of sociologists in Germanic countries, Slavic countries; French sociology, English sociology and North American sociology. The recent trend in sociological theory; the theory of action.

3 hours a week.

337. **Social Research:** Methods of research and their application in the analysis of social phenomena. Emphasis is given to the formulation of research problems, the selection of samples, the methods of data collection and alternate forms of statistical analysis.

3 hours a week.

II. ANTHROPOLOGY

10. **Introduction to Anthropology:** A study of the social organization and cultural heritage of ancient, primitive and complex cultures.

3 hours a week.

28. **Cultural Anthropology:** Discussion of anthropological theories. The study of cultural and social changes and patterns of cultural contacts; the analysis of social institutions of non-Western peoples and of their value systems.

3 hours a week.

Honours Course

228. **Cultural Anthropology:** Discussion of anthropological theories. The study of cultural and social changes and patterns of cultural contacts; the analysis of social institutions of non-Western peoples and of their value systems.

3 hours a week.

SPANISH

(See p. 170.)

SPEECH

For staff, see English Department, p. 146.

15y. **Public Speaking.**
1 hour a week (half course).

20. **Advanced Public Speaking.**
2 hours a week.

ZOOLOGY

(See p. 123.)

SEMESTER-HOUR EQUIVALENTS

The following list has been compiled for the convenience of evaluating committees in institutions which employ a credit system.

I. Grade XIII Subjects:

Two papers in each of: English, French, German, Greek, Italian, Latin, Spanish 6

Chemistry, Physics (each) 4

Algebra, Botany, Geography, Geometry, History, Mathematics of Investment, Music, Trigonometry, Zoology (each) 3

II. University Subjects:

	Semester Credits
Anthropology	
10	6
28	6
228	6
Biology	
1	6
1a	3
16a	4
29y	4
30b	3
329y	4
330b	3
337y	4
441a	3
442b	3
443	6
Botany	
1a	3
10	6
16b	4
23	6
24	6
27a	3
36	6
37b	3
224	6
323	6
336	6
400	6
427a	3
437b	3
440b	3

	Semester Credits
Administration	
Business	
15a	3
15b	3
250	8
251	6
346a	3
346b	3
350	6
351	6
352a	3
352b	3
353	6
355	6
356	6
360	6
446a	3
446b	3
450a	3
450b	3
452a	3
452b	3
453	6
457b	3
458a	3
458b	3
459	6
460a	3
470b	6
480	6
489	6
490	6
491	6

	Semester Credits
493	6
494	6
496	6
Chemistry	
1a	4
1	5
10	8
22	6
23	6
24	4
24z	4
33	6
33x	4
34	6
36	6
36x	4
222	6
223	8
224	4
224z	4
232	8
332	6
333	7
334	8
334x	6
335	5
336	8
336x	6
344	10
444	6
444x	4
446a	5
446b	5
449	12

	Semester Credits
450y	2
451y	2
454	4
456a	3
456b	3
464	6
464x	4
Drama	
20	6
22	6
30	6
32	6
34	6
36	4
Economics	
15	4
19	6
21	6
23	6
31	6
34	6
36	6
37a	3
37b	3
218	6
221	6
223	6
237a	3
237b	3
301	6
331	6
334	6
336	6
338	6

	Semester Credits
353	6
400	6
401	6
402	6
406a	3
406b	3
410	6
430	6
432b	3

English

5	6
11	4
15	6
21	6
22	6
31a	2
33y	2
34	6
35	6
36	6
38	6
39	6
212y	2
236	6
250	6
254	6
333	6
335	6
350	6
356	6
358	6
363	6
441y	2
447	6
450	6
459	6
460	6
463	6
470y	2

Fine Arts

10	6
11	6
12	6
20	8
21	8
22	6

French

A	6
2	6
12	6
22y	2
23y	4
27	6
31	6
37	6
260y	2
261y	2
270	6
375y	2
376y	2
380	6
490	6
495	6
496y	2

Geography

10	6
19	6
21	6
22a	3
22b	3
24	6
31	6
32	6
33	6
34	6
219	6
324	6
334	6

Geology

10	6
10e	5

German

A	6
2	6
12	6
21	4
31	6

Greek

A	6
2	6
12	6
322	6

History

4	6
10	6
11	4
22	6
23a	3
24	4
26	4
27	6
32	6
33	6
34	4
35	6
36	6
37	6
38	6
39	6
222	6
236	6
257	6
324	6
330	6
332	6
333	6
334	6
335	6
337	6
425	6
438	6
439	6
452	6
455	6
458	6
461	6

Home Economics

10	6
25a	3
25b	3
27	6
31	6
37	6

Italian

A	6
2	6
12	6

Latin

A	6
2	6
12	6
21	6
22	6
24	6
31	6
32	6
33	6
35	6
36	6
37	4
222	6
224	6
331	6
332	6
333	6
335	6
450	6
451	6

Mathematics

1y	3
2y	3
3y	3
4a	3
4b	3
11	6
13b	3
15	6
21	6
22	8
22x	6
23	4
25a	5
25ax	4
25b	5

	Semester Credits
25bx	4
25	10
25x	8
27	6
27x	4
30a	3
30b	3
32a	3
32b	3
33a	5
33b	5
35a	4
35b	4
35x	4
37	6
39b	3
40	4
221	6
227	6
229	8
254a	5
254b	5
300	6
331	6
332	6
338a	3
338b	3
341a	3
341b	3
354	6
400	6
429b	3
435y	2
437	6
438b	3
444	6
448	6
449a	3
449b	3
450a	3
450b	3
451	6
453	6

Music	Semester Credits
1	6
2y	2
3y	2
11	6
12	6

Nursing	Semester Credits
1a	2
10a	3
16b	2
30a	3
30b	3
31	6
32b	2
33a	2
33y	2
34	8
35	6
36b	2
37	4
38	5
39b	1

Philosophy	Semester Credits
15	6
15a	3
21a	3
22	4
24	6
25a	3
25b	3
26b	3
27	6
28	6
31	6
33a	3
33b	3
34	6
35a	3
35b	3
36a	2
36b	2
39	4
221a	3
222	6
224	6

	Semester Credits
226b	3
228	6
327	6
333a	3
333b	3
334	6
336a	3
336b	3
411	6
431	6
432b	3
435a	3
435b	3
439	6
447	6

Physics	Semester Credits
1	5
1a	4
10	8
12	5
13	8
15	5
22	8
23	8
26	8
27	5
27x	4
31	6
34	6
36	6
36x	4
46	4
222	8
223	8
331	6
334	6
336	6
350	6
370	6
442a	3
442b	3
450	6
451	6
452	6
453a	3
453b	3

	Semester Credits
466a	3
466b	3
470	6

Political Science	Semester Credits
12	6
20	4
21	6
22	4
31	6
32	6
212	6
220	6
221	6
331	6
334	6
432a	3
443	6
452	6

Psychology	Semester Credits
15	6
21	4
22	6
26a	3
26b	3
28	6
30	6
31	6
33a	3
34	6
35a	3
222	6
228	6
230	6
231	6
233a	3
326a	3
327	6
333b	3
334	6
353	6
429	6
450	6
451	6
452	6
454	6

	Semester Credits
Religious Knowledge	
C10	4
14a	2
14b	2
15	4
C20	4
22a	2
22b	2
24a	2
24b	2
C30	4
33a	3
33b	3
34a	2
34b	2
C36a	2
C36b	2
Russian	
A	6
Ax	6
2	6
12	6

	Semester Credits
Sociology	
11a	2
12	6
23	6
25a	3
25b	3
27	4
29	4
35	6
37	6
229	6
335	6
337	6
Spanish	
A	6
2	6
4	10
12	6
22y	2
23y	4

	Semester Credits
25	6
34	6
36	6
222y	2
223y	4
225	8
333	6
334	6
338y	3
432	6
433	6
436	6
437	6
438y	3
Speech	
15y	2
20	4

	Semester Credits
Zoology	
1a	3
10	6
22	10
25b	3
26a	3
27	6
28	6
34a	3
36b	3
222	10
325b	3
327	6
328	6
334a	3
336	6
400	6
440a	5

THE FACULTY OF APPLIED SCIENCE

Pure and Applied Science Building

THE FACULTY OF APPLIED SCIENCE

Faculty Council

F. A. DeMarco, Ph.D., Dean of the Faculty.

Rev. E. C. LeBel, C.D., C.S.B., M.A., LL.D., President of the University.

Rev. H. V. Mallon, C.S.B., M.A., Executive Vice-President.

Barbara Helen Birch, M.A., Registrar.

Maurice Adelman, Ph.D., Chemical Engineering.

H. P. Herbich, D.Sc., Civil Engineering.

H. R. Fletcher, M.A.Sc., Electrical Engineering.

W. G. Colborne, M.Sc., Mechanical Engineering.

R. G. Billinghurst, M.A.Sc., Engineering Science.

Officers of Instruction

Maurice Adelman; B.A.Sc. (Toronto), M.A.Sc. (ibid.), Ph.D. (ibid.). Professor and Head, Department of Chemical Engineering —1956.

Haralambos A. Apostolopoulos; B.Civ. Eng. (Minnesota), M.S.C.E. (ibid.). Assistant Professor of Civil Engineering—1960.

George Borys Babiy; B.Sc. (Manitoba), M.Sc., M.E. (ibid.). Assistant Professor of Mechanical Engineering—1959.

Robert Gordon Billinghurst; B.A.Sc. (Toronto), M.A.Sc. (ibid.). Associate Professor and Head, Department of Engineering Science—1957.

William George Colborne; B.Sc. (Queen's), M.Sc. (ibid.). Associate Professor and Head, Department of Mechanical Engineering—1958.

Gabriel Tibor Csanady; Dipl. Ing. (Munich), Ph.D. (N.S.W.U.T.). Associate Professor of Mechanical Engineering—1961.

Frank Anthony DeMarco; B.A.Sc. (Toronto), M.A.Sc. (ibid.), Ph.D. (ibid.). Professor and Dean, Faculty of Applied Science—1946.

Douglas Donald Duquette; B.A. (Western Ontario), M.S. (Michigan State), B.S. (ibid.). Assistant Professor of Civil Engineering —1952.

Harold Ross Fletcher; B.A.Sc. (Toronto), M.A.Sc. (ibid.). Assistant Professor and Head, Department of Electrical Engineering —1958.

Alex William Gnyp; B.A.Sc. (Toronto), M.A.Sc. (ibid.), Ph.D. (ibid.). Associate Professor of Chemical Engineering—1958.

James Paul Hartt; B.A.Sc. (Toronto), O.L.S., M.S.C.E. (Wayne State). Assistant Professor of Civil Engineering—1958.

Henryk Pawel Herbich; Dipl. Ing. (Warsaw), D.Sc. (Eng.) (Edinburgh). Professor and Head, Department of Civil Engineering—1959.

Rev. Arthur Robert Howell, C.S.B.; B.Sc. (Saskatchewan), S.T.B. (St. Michael's, Toronto), M.A.Sc. (Toronto). Assistant Professor of Mechanical Engineering—1958.

Hwei Piao Hsu; B.S. (National Taiwan U.), M.S. (Case Inst. of Technology), Ph.D. (ibid.). Assistant Professor of Electrical Engineering—1961.

Jacob John Michael Huschilt; B.A.Sc. (Toronto). Lecturer in Electrical Engineering—1960.

Hu Hsien Hwang; B.Sc. (National Chiao-Tung (Shanghai)), M.S. (Lehigh), Ph.D. (ibid.). Assistant Professor of Electrical Engineering—1959.

Surindra Nath Kalra; B.Sc. (Panjab), M.S. (Illinois), Ph.D. (ibid.). Associate Research Professor of Electrical Engineering—1962.

Ihor Koszman; B.A. (Columbia), B.S. (ibid.), M.S. (Johns Hopkins), D.Eng.Sc. (ibid.). Assistant Professor of Chemical Engineering—1961.

Jan Tadeusz Laba; Dip. Ing. (London). Lecturer in Civil Engineering—1961.

Gerard R. Monforton; B.A.Sc., M.A.Sc. Instructor in Civil Engineering—1962.

Cameron Hayes Montrose; B.Sc. (Queen's). Instructor in Civil Engineering—1957.

Paul Alexander Vivian Thomas; B.Sc.Eng. (London), Ph.D. (Glasgow). Associate Professor of Electrical Engineering—1962.

Chi Tien; B.S. (National Taiwan University), M.S. (Kansas State University), Ph.D. (Northwestern University). Associate Professor of Chemical Engineering—1959.

Henry Joseph Tucker, B.Eng. (McGill), M.Eng. (ibid.). Assistant Professor of Mechanical Engineering—1960.

Gadi V. Venkatesulu; B.E. (Mysore), M.S.E.E. (Lehigh). Assistant Professor of Electrical Engineering—1961.

Tze Sun Wu; B.S. (National Chiao-Tung (Shanghai)), M.S. (Washington), Ph.D. (Illinois). Associate Professor of Civil Engineering—1957.

Michael Yuk-Man Yau; B.Eng. (McGill). Instructor in Electrical Engineering—1961.

ACADEMIC REGULATIONS

I. Admission Requirements:

EITHER: Grade XIII (or equivalent) with:

60% combined average in Algebra, Geometry, and Trigonometry; 60% combined average in Physics and Chemistry; English (2 papers), and
Either Another language (2 papers),

Or 2 papers from: Botany, Geography, History, Zoology, providing a Grade XII language has been completed.

OR: Preliminary Year in Science or equivalent with:

60% combined average in Mathematics, and
60% combined average in Science.

The Committee on Admissions may admit an applicant to First Year with eight papers, without conditions, provided that he has the necessary prerequisites for the program he wishes to enter, and has an average of 66% on the eight papers.

II. General Regulations: see p. 48 ff.

III. Particular Regulations:

1. The student must hand in all laboratory reports and specified homework assignments before he can present himself for the final examination.

2. The student must attend all laboratories unless he has special permission from his instructor or a medical certificate to account for his absence.

3. **Failure**

A student who fails to gain a passing mark in more than three full courses or more than four papers fails his year and is not allowed to write supplementals. He is required to repeat his year, retaining credit in courses in which he obtained **Class I** standing and possibly other courses at the discretion of the Academic Standing Committee. **For subjects taken outside of the Faculty of Applied Science the appropriate regulations will apply.**

A student who fails to obtain an overall average of 55% before supplementals fails his year and the same conditions apply as in the above paragraph.

4. **Repeated Year**

No student while repeating his year is allowed to take courses in the next higher year.

A student who is repeating his year must obtain a passing grade in each subject and an overall average of 60% in the subjects of the repeated year.

If a repeating student fails final exam(s) in January he may be asked to withdraw at the end of the first semester.

5. **Supplementals**

A student who has an overall 55% average in his final January and Spring examinations is allowed to write supplementals in failed subjects provided he has not failed more than three full courses or four papers.

These supplementals must be written in all failed subjects at the first opportunity and at the designated time and place.

The final grade after a supplemental will include the term mark for the year. Where laboratory work is not considered satisfactory some additional work in the laboratory portion of the course may be required at the discretion of the instructor and his department head.

If a student has failed in more than one full course after supplementals he must repeat the year.

If a student writes all required supplementals and fails to obtain a passing grade in not more than one full course he may be allowed conditions (see below).

If a student fails a supplemental in Fourth Year his case will be considered by the Academic Standing Committee.

6. **Conditions**

A condition is defined as a course or part of a course in which pass standing has not been obtained. Such courses should be repeated in their entirety but where time-tabling makes this impossible a student is allowed to "carry" the course by attending instructional sessions whenever possible and by self-study.
A condition must be cleared at the first time an examination in that subject is offered.

A condition may not be carried for more than one year. That is, a First Year subject cannot be carried into the Third Year, and a Second Year subject cannot be carried into the Fourth Year. If it is not cleared in that year the student must repeat the course or the entire year or otherwise fulfil the requirements on the decision of the Academic Standing Committee.

No student is permitted to carry a subject into the next higher year unless he has tried the supplemental examination in that subject.

Supplementals are allowed in "condition" subjects provided that the total number of supplementals for one student does not exceed three courses or four papers.

In the case of Fourth Year students carrying a condition, if at any time during the fourth year a student and his instructor feel that the student is prepared to clear the condition, application may be made for a special examination in that subject. (see p. 55, par. 3, for regulations). Such examination will be subject to department heads' approval and must be written before March 1 subject to the usual fees. If a special examination is not passed then a supplemental (subject to the usual regulations) may be written in the Spring.

7. **Grading**

Candidates in the Engineering course will be ranked in order of merit in each year and in each subject in four classes; those who obtain 75% or over of the total number of marks will be placed in Class I (those who obtain 85% or over will be granted "honours with distinction"); those who obtain 66% to 74% will be placed in Class II; those who obtain 60% to 65% will be placed in Class III; those who obtain 50%, the minimum for pass, to 59%, will be placed in Class IV. Standing in general subjects will be in dicated by letter grades (see p. 75).

8. **Requirements for Graduation**

In order to present himself as a candidate for the Bachelor of Applied Science degree a student must have obtained a passing grade in all of the required and optional subjects and must have completed all other requirements. (See also p. 60).

9. **Honours Standing**

A candidate will graduate with honours if he has fulfilled all the requirements above and if ~~in~~ addition he has obtained honours (75% or better) standing in his final year and one other undergraduate year.

10. **Extracurricular activities**

Each student must report to his counsellor on all extra-curricular activities. A student who does not maintain a standing of 60% at any time during the year will be automatically suspended from major extracurricular activities (intercollegiate sports, holding office in Student Council, Engineering Society or other clubs which are active on an all-year basis), and possibly suspended from minor activities (intramural sports and all activities of a minor nature or short duration). A student who does not have a 60% average may not be a candidate for student government office or for the intercollegiate basketball team without special written consent of the Dean.

BACHELOR OF APPLIED SCIENCE

The Curriculum:

The engineering curriculum given below is established on the premise that the University must attempt to make a contribution to the development of the student as a person, and on the assumption that the graduate will become a professional engineer with certain obligations to society.

To meet his technical responsibility to society, the graduate engineer must be prepared to perform the functions of analysis and design and to use these in the production, construction, and operation of machines and processes on a scientific and economic basis. To meet his social responsibility, the graduate who becomes a professional engineer must have qualities of leadership, a deep sense of professional ethics, and a broad general education.

The object of the curriculum is flexibility rather than specialization. Engineering is essentially a creative and rapidly-changing profession which, in its various fields, presents a multitude of specialties and activities that require a sound knowledge of basic mathematics and physical and engineering sciences. Our curriculum attempts to give the student a very broad yet intense foundation in the basic sciences so that, regardless of his undergraduate specialty, he will be prepared to meet the challenge of industrial problems in the vast new areas opened up by the continued growth of these sciences.

The undergraduate curriculum is essentially a program of education with selected courses in the humanities, emphasis on the basic sciences, and an introduction to the broad aspects of technology. The humanities develop the student as a person and enable him to appreciate his responsibilities to his profession and to society. The basic sciences give him flexibility in the pursuance of advanced studies and in his approach to the various specialties. The introduction to technology gives him an appreciation of the practical approach in the scientific and economic solution of problems for the benefit of mankind.

Note: The curricula for Chemical, Civil, Electrical and Mechanical Engineering, and for the metallurgy option in Engineering Science, have been accepted by the Association of Professional Engineers of Ontario for purposes of registration of the graduates.

FIRST YEAR (common to all Engineering courses)

	First Semester Lect.	First Semester Lab.	Second Semester Lect.	Second Semester Lab.
Philosophy 15	3	0	3	0
Chem. 10 (Gen. Chem., Qualitative Analysis)	3	3	3	3
Math. 11 (General Mathematics)	2	2	2	2
Math. 15 (Differential and Integral Calculus)	3	0	3	0
Phys. 12 (Mechanics, Heat and Sound)	4	3	0	0
Phys. 15 (Optics, Electricity, Magnetism)	0	0	4	3
C. E. 100a (Engineering Drawing)	1	5	0	0
C. E. 100b (Descriptive Geometry)	0	0	1	3
C. E. 101 (Engineering Mechanics)	2	1	2	1
G. E. 101 (Orientation)				
G. E. 102 (Practical Experience) (see p. 216)				

I. CHEMICAL ENGINEERING

The expanding chemical industry requires more and more chemical engineers to spearhead its operation. Students contemplating careers in Chemical Engineering can therefore look forward to employment opportunities in technical sales, plant and equipment design, process design and control, production, and basic research in such fields as fermentation, petroleum, synthetic plastics and detergents, protective coatings and a host of other related industries. The Chemical Engineering program at Essex College is designed to give the student the basic requirements for such a future and to allow him maximum opportunity to choose his field of interest.

This course has been accredited by the Association of Professional Engineers of Ontario for purposes of registration of the graduates.

	First Semester		Second Semester	
	Lect.	Lab.	Lect.	Lab.
SECOND YEAR				
R. K. C20 or 24 or Philosophy 22	2	0	2	0
History 26	2	0	2	0
Math. 25ax (Intermed. Calculus)	4	0	0	0
Math. 25bx (Vector Calc., Differ. Equat.)	0	0	4	0
Math 27 (Probability, Complex Var., Laplace Trans.)	2	2	2	2
Chemistry 22 (Quantitative Analysis)	2	3	2	3
C. E. 201x (Mechanics of Materials)	2	0	2	0
E. E. 200a (Electrical Fundamentals)	2	3	0	0
E. E. 201b (Electrical Machines)	0	0	2	3
Ch. E. 200 (Elementary Process Calculations)	2	1½	2	1½
G. E. 102 (Practical Experience) (see p. 216)				
THIRD YEAR				
Philosophy 25a	0	0	3	0
English 31a	2	0	0	0
Mathematics 35a (Partial Differential Equations)	3	0	0	0
Mathematics 35b (Numerical Analysis)	0	0	3	3
Chemistry 23 (Organic Chemistry)	2	3	2	3
Chemistry 334 (Physical Chemistry II)	3	3	3	3
M. E. 300ax (Fluid Mechanics)	2	0	0	0
Ch. E. 300b (Chemical Process Technology)	0	0	2	0
Ch. E. 301 (Unit Operations)	2	3	2	3
Ch. E. 302 (Chem. Eng. Thermodynamics)	3	0	3	0
Ch. E. 303a (Instrumental Analysis)	0	3	0	0
G. E. 102 (Practical Experience) (see p. 216)				
FOURTH YEAR				
Economics 15	2	0	2	0
Humanities Option	3	0	0	0
Chem. 33x (Interm. Organic Chemistry)	2	0	2	0
Chem. 444x (Physical Chemistry III)	2	0	2	0
Chem. 464x (Physical Chemistry V)	2	0	2	0
Physics 36x (Modern Physics)	2	0	2	0
G. E. 400b (Engineering Profession, Law)	0	0	2	0
Ch. E. 401 (Mass Transfer Operations)	2	3	2	3
Ch. E 402 (Chem. Eng., Kinetics)	2	0	2	0
Ch. E. 404 (Plant Design)	1	3	1	3
Ch. E. 410y (Senior Project) or Option	0	3	0	3

II. CIVIL ENGINEERING

The field of Civil Engineering includes the conception, design, operation and maintenance of schemes, including buildings, highways, railroads, waterways, airports, bridges, harbours, tunnels, water supply and purification systems, sewage collection and treatment facilities, hydraulic structures, dams, water power developments, and the conduction of surveys and research. The Civil Engineering curriculum at Essex College provides for a diversity of applied course work to aid the student in selecting his major field of endeavour as well as a thorough background in the basic sciences and a broad understanding of the social sciences and humanities.

This course has been accredited by the Association of Professional Engineers of Ontario for purposes of registration of the graduates.

A graduate in Civil Engineering from this University will be allowed the full reduction in time of apprenticeship according to Section 23(a) of the Ontario Land Surveyors Act.

The apprenticeship will be two years instead of the usual four years, under articles with a practising surveyor, duly filed as required by Section 27 of the same act.

SECOND YEAR

	First Semester Lect.	First Semester Lab.	Second Semester Lect.	Second Semester Lab.
R. K. C20 or 24 or Philosophy 22	2	0	2	0
History 26	2	0	2	0
Geology 10e (Introductory)	2	2	2	0
Math 25a (Intermed. Calculus)	4	2	0	0
Math 25b (Vector Calc., Differ. Equat.)	0	0	4	2
Chem. 24 (Physical Chemistry I)	2	0	2	0
E. S. 200 (Engineering Materials)	2	0	2	0
C. E. 200y (Graphic Statics)	0	1½	0	1½
C. E. 201 (Mechanics of Materials)	2	1½	2	1½
C. E. 202 (Surveying & Photogrammetry)	3	3	3	3
G. E. 102 (Practical Experience) (see p. 216)				

THIRD YEAR

Philosophy 25a	0	0	3	0
English 31a	2	0	0	0
Math. 35a (Partial Differential Equations)	3	2	0	0
Math 35b (Numerical Analysis)	0	0	3	3
E. E. 200a (Electrical Fundamentals)	2	3	0	0
E. E. 201b (Electrical Machines)	0	0	2	3
M. E. 300ab (Fluid Mechanics)	2	1½	2	1½
C. E. 300 (Structural Analysis and Design I)	2	3	2	3
C. E. 302 (Hydrology)	2	1½	1	1½
C. E. 303 (Soil Mechanics)	2	1½	2	1½
C. E. 304 (Reinforced Concrete)	2	1½	2	1½
G. E. 102 (Practical Experience) (see p. 216)				

FOURTH YEAR

	First Semester Lect.	First Semester Lab.	Second Semester Lect.	Second Semester Lab
C. E. 401 (Civil Eng. Summer Camp, 3 weeks)				
Economics 15	2	0	2	0
Humanities Option	3	0	0	0
Physics 36x (Modern Physics)	2	0	2	0
G. E. 400b (Engineering Profession & Law)	0	0	2	0
C. E. 400 (Structural Analysis, Design II)	2	3	2	3
C. E. 402 (Advanced Hydraulics)	2	3	2	3
C. E. 403 (Foundation Engineering)	2	1	2	1
C. E. 404 (Transportation Engineering)	2	1	2	0
C. E. 405 (Sanitary Engineering)	2	3	2	3
C. E. 406b (Construction Methods & Machines)	0	0	2	0
C. E. 410b (Essay & Seminar)	0	0	1	2

III. ELECTRICAL ENGINEERING

The electrical engineer is one who practices the science and art of economically "directing the sources of electrical energy in nature for the uses and conveniences of man." He may design, manufacture, install, operate or sell electrical machinery and equipment, manage plants or promote engineering projects. Our curriculum gives the student a strong program in general education and a sound technical training—a foundation sufficiently fundamental to facilitate his placement in any branch of the wide field of Electrical Engineering which today ranges from microwave communications to central power-station generation and transmission.

This course has been accredited by the Association of Professional Engineers of Ontario for purposes of registration of the graduates.

SECOND YEAR

	First Semester Lect.	First Semester Lab.	Second Semester Lect.	Second Semester Lab
R. K. C20 or 24 or Philosophy 22	2	0	2	0
History 26	2	0	2	0
Math 25a (Intermediate Calculus)	4	2	0	0
Math 25b (Vector Calc., Diff. Equat.)	0	0	4	2
Math 27 (Probability, Complex Var., Laplace Trans.)	2	2	2	2
Chem. 24 (Physical Chemistry I)	2	0	2	0
E. S. 200 (Engin. Materials)	2	0	2	0
C. E. 201 (Mechanics of Materials)	2	1½	2	1½
E. E. 200a (Electrical Fundamentals)	2	3	0	0
E. E. 202b (Circuit Analysis I)	0	0	2	1½
E. E. 204b (Electrical Measurements)	0	0	2	3
G. E. 102 (Practical Experience) (see p. 216)				

THIRD YEAR

Philosophy 25a	0	0	3	0
English 31a	2	0	0	0
Math 35a (Partial Differential Equations)	3	2	0	0
Math 35b (Numerical Analysis)	0	0	3	3
M. E. 300a (Fluid Mechanics)	2	1½	0	0
M. E. 305b (Introduction to Heat Transfer)	0	0	2	1½
E. E. 300 (Electromagnetic Theory)	2	1½	2	1½
E. E. 302 (Circuit Analysis II)	4	1½	0	0
E. E. 303 (Electrical Energy Conversion I)	2	3	2	3
E. E. 306ab (Electronics I and II)	2	1½	4	3
G. E. 102 (Practical Experience) (see p. 216)				

FOURTH YEAR

	First Semester Lect.	First Semester Lab.	Second Semester Lect.	Second Semester Lab.
Economics 15	2	0	2	0
Humanities Option	3	0	0	0
Physics 36x (Modern Physics)	2	0	2	0
G. E. 400b (Engineering Profession, Law)	0	0	2	0
E. E. 403a (Electrical Energy Conversion II)	2	3	0	0
E. E. 407b (Control Systems)	0	0	3	3
E. E. 408a (Electrical Transmission)	2	1½	0	0
E. E. 409ab (Communications I and II)	3	3	3	1½
E. E. 410b (Seminar)	0	0	0	3
E. E. 412a (Digital Systems)	3	1½	0	0
E. E. 411b (High Frequency Electronics) or E. E. 414b (Power Systems)	0	0	3	1½

IV. MECHANICAL ENGINEERING

Due to the broad scope and almost unlimited number of specialties falling within the field of Mechanical Engineering, it becomes impossible to concentrate on specialized fields of study. A firm foundation in the basic sciences and mathematics is essential. This emphasis is also made necessary because increasing numbers of Mechanical Engineering graduates are being employed in research and development in government and industry, or going on to further studies at the post-graduate level. Upon graduation, the Mechanical Engineer has open to him a great variety of jobs, the following fields being a few examples: power plant and engine design, refrigeration and air conditioning, turbomachinery design, gas dynamics and aeronautics, production and general industrial engineering. Such fields as Business Administration may also be followed at the graduate level. Since many Mechanical Engineers advance to management positions in industry and take on social responsibilities within their communities, the broad education as provided by study of the humanities is deemed necessary. This course has been accredited by the Association of Professional Engineers of Ontario for purposes of registration of the graduates.

SECOND YEAR

	First Semester Lect.	First Semester Lab.	Second Semester Lect.	Second Semester Lab.
R.K. C20 or 24 or Philosophy 22	2	0	2	0
History 26	2	0	2	0
Math 25a (Intermediate Calculus)	4	2	0	0
Math 25b (Vector Calc., Diff. Equat.)	0	0	4	2
Math 27 (Probability, Complex Var., Laplace Trans.)	2	2	2	2
E. S. 200 (Engin. Materials)	2	0	2	0
C. E. 201 (Mechanics of Materials)	2	1½	2	1½
E. E. 200a ((Electrical Fundamentals)	2	3	0	0
E. E. 201b (Electrical Machines)	0	0	2	3
M. E. 200a (Kinematics and Dynamics)	2	3	0	0
M. E. 200b (Mechanics of Machinery)	0	0	2	3
G. E. 102 (Practical Experience) (see p. 216)				

THIRD YEAR

Philosophy 25a	0	0	3	0
English 31a	2	0	0	0
Math 35a (Partial Differential Equations)	3	2	0	0
Math 35b (Numerical Analysis)	0	0	3	3
E. S. 310a (Engineering Metallurgy)	2	3	0	0
E. E. 305 (Circuits and Electronics)	2	0	2	1½
M. E. 300ab (Fluid Mechanics)	2	1½	2	1½
M. E. 301a (Elasticity)	2	2	0	0
M. E. 301b (Vibrations)	0	0	2	1½
M. E. 303 (Introduction to Thermodynamics)	2	1½	2	1½
M. E. 304 (Principles of Heat Transfer)	2	1½	3	1½
G. E. 102 (Practical Experience) (see p. 216)				

FOURTH YEAR

Economics 15	2	0	2	0
Humanities Option	3	0	0	0
Physics 36x (Modern Physics)	2	0	2	0
G. E. 400b (Engineering Profession and Law)	0	0	2	0
M. E. 401 (Machine Design)	2	3	2	3
M. E. 403 (Engineering Thermodynamics)	2	3	2	3
M. E. 406a (Theory of non-viscous fluids)	2	1½	0	0
M. E. 406b (Turbomachines)	0	0	2	3
M. E. 407b (Control Theory)	0	0	3	1½
M. E. 410a (Essay and Seminar)	0	3	0	0
*Option	2	1½	2	1½

* The option may be one of: C.E. 402, Advanced Hydraulics; M.E. 402, Internal Combustion Engines; M.E. 404, Heating and Air Conditioning; or M.E. 405, Power Plant Engineering. For a student with a B or better average who intends to proceed to graduate work, the option may be chosen from mathematics or the graduate course offerings. The choice of any option must be made in consultation with the Department Head.

V. ENGINEERING SCIENCE

(Engineering Physics)

The Engineering Science department is constituted so as to bridge the gap between the physical sciences and conventional engineering technology. The curriculum is designed for those students particularly gifted in mathematics and in the physical sciences, and special emphasis is placed on fundamental principles wherein a strong foundation in mathematics and physics is essential. As a result, it is expected that Engineering Science students will have a broader outlook, be better able to cope with diverse technical problems and better able to understand the development of science and recognize useful applications.

It is anticipated that the Engineering Science student will have an interest in a career directed toward research and development in industry or government laboratories or toward teaching and research at the university level. Since such careers require study beyond the Bachelor level, the curriculum gives excellent preparation for advanced education in various fields of specialization: applied mechanics, chemical engineering, electrochemistry, electronics, fluid mechanics, physical metallurgy, heat-power mechanical engineering.

Students entering the Second Year are required to have a minimum overall average of 66% in the work of the First Year.

At the beginning of the Third Year, an Engineering Science student is required to select an option for specialization in the Third and Fourth Years.

The course in Physical Metallurgy has been approved by the Association of Professional Engineers of Ontario for purposes of registration of the graduates. Other options will be considered on their own merits when the choice is made by the students.

SECOND YEAR

	First Semester Lect.	First Semester Lab.	Second Semester Lect.	Second Semester Lab.
R. K. C20 or 24 or Philosophy 22	2	0	2	0
History 26	2	0	2	0
Mathematics 227 (Modern Algebra)	3	1	3	1
Mathematics 254 (Advanced Calculus)	4	1	4	1
Physics 222 (Optics)	3	3	3	3
Physics 223 (Electricity and Magnetism)	3	3	3	3
C. E. 201 (Mechanics of Materials)	2	1½	2	1½

G. E. 102 (Practical Experience) (see p. 216)

THIRD YEAR

English 31a	2	0	0	0
Philosophy 25a	0	0	3	0
Mathematics 33a (Adv. Calculus, Part Diff. Equations)	4	2	0	0
Mathematics 33b (Adv. Calculus, Numerical Analysis)	0	0	4	3
Mathematics 338a (Functions of a Complex Var.)	3	0	0	0
Mathematics 338b (Complex Var., Laplace Trans.)	0	0	2	2
Physics 331 (Thermodynamics)	2	0	2	0
G. E. 102 (Practical Experience) (see p. 216)				

and one of the following options:

Applied Mechanics Option

C. E. 300 (Structural Analysis and Design I)	2	3	2	3
M. E. 200a (Kinematics, Dynamics)	2	0	0	0
M. E. 300ab (Fluid Mechanics)	2	1½	2	1½
M. E. 301a (Elasticity)	2	2	0	0
M. E. 301b (Vibrations)	0	0	2	1½

Chemical Option

Chemistry 334 (Physical Chemistry II)	3	3	3	3
Ch. E. 301 (Unit Operations I)	2	3	2	3
M. E. 300a (Fluid Mechanics)	2	0	0	0

Electronics Option

E. E. 204b (Electrical Measurements)	0	0	2	3
E. E. 302 (Circuit Analysis II)	4	1½	0	0
E. E. 306ab (Electronics I and II)	2	1½	4	3
M. E. 300ab (Fluid Mechanics)	2	1½	2	1½

Physical Metallurgy Option

E. S. 300 (Physical Metallurgy I)	2	3	3	3
Ch. E. 302 (Chemical Engineering Thermodynamics)	3	0	3	0
M. E. 300ab (Fluid Mechanics)	2	1½	2	1½

Thermodynamics Option

Ch. E. 302 (Chemical Engineering Thermodynamics)	3	0	3	0
M. E. 300 ab (Fluid Mechanics)	2	1½	2	1½
M. E. 304 (Principles of Heat Transfer)	2	1½	3	1½

FOURTH YEAR

Economics 15	2	0	2	0
Humanities Option	3	0	0	0
Mathematics 453 (Methods of Applied Mathematics)	2	0	2	0
Physics 336 (Modern Physics)	2	0	2	0
Physics 350 (Theoretical Physics I)	3	0	3	0
Physics 370/1 (Physics Laboratory)	0	2	0	2
G. E. 400b (Engineering Profession and Law)	0	0	2	0

and one of the following options:

Applied Science

Applied Mechanics Option

E. E. 305 (Circuits and Electronics)	2	0	2	1½
*Any three of:				
C. E. 400 (Structural Analysis and Design II)	2	3	2	3
C. E. 500 (Advanced Mechanics of Materials)	2	0	2	0
E. S. 501 (Experimental Stress Analysis)	2	1½	2	1½
M. E. 406a (Theory of Non-viscous Fluids)	2	1½	0	0

Chemical Option

Chem. 23 (Organic Chemistry)	2	3	2	3
Chem. 464x (Physical Chemistry V)	2	0	2	0
Ch. E. 401 (Mass Transfer)	2	3	2	3
Ch. E. 402 (Chemical Engineering Kinetics)	2	0	2	0

Electronics Option

E. E. 407b (Control Systems)	0	0	3	3
E. E. 408a (Electrical Transmission)	2	1½	0	0
E. E. 409ab (Communications I and II)	3	3	3	1½
E. E. 411b (High Frequency Electronics)	0	0	3	1½
E. E. 412a (Digital Systems)	3	1½	0	0

Physical Metallurgy Option

Chem. 334 (Physical Chemistry II)	3	3	3	3
E. S. 400 (Physical Metallurgy II)	2	3	2	3
E. S. 401 (X-ray Metallography)	1	1½	2	1½
E. E. 305 (Circuits and Electronics)	2	0	2	1½

Thermodynamics Option

M. E. 403 (Engineering Thermodynamics II)	2	3	2	3
*Any two full courses of:				
Ch. E. 501 (Chemical Engineering Thermodynamics)	2	0	2	0
E. E. 305 (Circuits and Electronics)	2	0	2	1½
M. E. 406a (Theory of Non-viscous Fluids)	2	1½	0	0
M. E. 407b (Control Theory)	0	0	3	1½

*To be chosen in consultation with the Head of the Department.

THE FACULTY OF APPLIED SCIENCE

DETAILS OF SUBJECTS

(For details of subjects taken by Engineering students and not listed below, see p. 118 ff.

Engineering Science

Associate Professor: R. G. Billinghurst, M.A.Sc., Head.

E.S. 200. **Engineering Materials:** The fundamental principles of the structure of matter as applied to engineering materials such as metals and alloys, resins and protective coatings, plastics, rubber, cement and concrete. A study of boiler water treatment and corrosion.

2 lectures a week.

E.S. 300. **Physical Metallurgy I:** Fundamental principles of physical metallurgy; solidification; alloying theory; plastic deformation; principles of heat treatment, recovery, recrystallization and grain growth; corrosion; crystallography and introduction to X-ray diffraction.

2 lectures, 3 laboratory hours a week, first term;
3 lectures, 3 laboratory hours a week, second term.

E.S. 310a. **Engineering Metallurgy:** Application of the principles of physical metallurgy to the consideration of the constitution, microstructure, heat treatment, properties and uses of ferrous and non-ferrous metals and alloys. Laboratory includes the use of the metallurgical microscope, construction of simple binary alloys, demonstration of the principles of solidification, cold working and heat treatment of metals.

2 lectures, 3 laboratory hours, first semester (half course).

E.S. 400. **Physical Metallurgy II:** Theory of nucleation and growth applied to phase transformations (martensitic, eutectoid, order-disorder changes); diffusion; electron theory; dislocation theory and application to work hardening, annealing and creep; nuclear metallurgy and radiation damage.

2 lectures, 3 laboratory hours a week.

E.S. 401. **X-ray Metallography:** The production and detection of X-rays; stereographic projection; single crystal orientation; preferred orientation and pole figures; crystal structure determination; lattice dimensions of cubic and non-cubic crystals; order-disorder transformations.

1 lecture, 1½ laboratory hours a week, first semester;
2 lectures, 1½ laboratory hours a week, second semester.

General Engineering

G.E. 101. **Orientation:** Instruction in library science; use of the slide rule.

G.E. 102. **Practical Experience:** Students in all branches of engineering are required to have, before graduation, practical work of a nature acceptable to the department concerned. Work done prior to admission to the University may be accepted.

Summer essays or reading assignments may be required in lieu of, or in addition to, practical work. Each student has the responsibility to make definite arrangements with his department head to clear this requirement.

In the senior year field trips may be required by departments, in which case the student is expected to pay the costs involved.

G.E. 400b. **Engineering Profession and Law:** The development of the engineering profession; professional engineering associations, societies, and services; the status of the engineer in the community; professional ethics. The law and the engineer; contract law and specifications; preparation of specifications and engineering contract documents; companies, partnerships, mechanics' liens, agency, patents. Duties of employees to employers, the duties and liabilities of engineers.

2 lectures a week, one semester.

Chemical Engineering

Officers of Instruction: Professor: Maurice Adelman, M.A.Sc., Ph.D. (Head); Associate Professor: C. Tien, M.S., Ph.D.; A. W. Gnyp, M.A.Sc., Ph.D.; Assistant Professor: Ihor Koszman, B.A., M.Sc., D. Eng. Sc.

Ch.E. 200. **Elementary Process Calculations:** Gas calculations, vapour pressure and heat capacity. Stoichiometry, material and energy balances in chemical processes. Introduction to graphical methods.

2 lectures, one 3 hour laboratory on alternate weeks.

Ch.E. 300b. **Chemical Process Technology:** The study of unit processes in Chemical Engineering and their integration in some selected industries.

2 lectures a week, one semester.

Ch.E. 301. **Unit Operations I:** Fundamentals of heat transfer. Introduction to design of heat exchangers. Screening, size reductions and solids handling. Pressure drop and energy requirement calculations. Filtration, fluidization, drying and evaporation. Plant visits.

2 lectures, 3 laboratory hours a week.

Ch.E. 302. **Chemical Engineering Thermodynamics:** The application of thermodynamic principles to chemical engineering practice.

3 lectures a week.

Ch.E. 303a. **Instrumental Analysis:** Physico-chemical measurements used in industry, and the determination of properties.

3 laboratory hours a week, first semester.

Ch.E. 401. **Unit Operations II:** Methods of solution of problems in distillation, extraction, gas absorption, leaching. Introduction to the general theory of transport phenomena.

2 lectures, 3 laboratory hours a week.

Ch.E. 402. **Intermediate Chemical Engineering Thermodynamics and Kinetics:** Application of thermodynamics and kinetics to problems in the field of chemical engineering.

2 lectures a week.

Ch.E. 404. **Plant Design:** Design of pilot plant and larger equipment.

1 lecture, 3 laboratory hours a week.

Ch.E. 410y. **Senior Project:** A full literature study on the technical factors involved in the establishing of a chemical industry.

3 laboratory hours a week, both semesters.

Civil Engineering

Officers of Instruction: Professor: H. P. Herbich, Dipl. Ing., D.Sc. (Head); Associate Professor: T. S. Wu, M.S., Ph.D.; Assistant Professors: D. D. Duquette, B.A., M.S., B.S.; J. P. Hartt, B.A.Sc., O.L.S., M.S.C.E.; H. A. Apostolopoulos, B.Civ.Eng., M.S.C.E.; Lecturer: J. T. Laba, Dipl. Ing.; Instructor: C. H. Montrose, B.Sc.

C.E. 100a. **Engineering Drawing:** Lettering; use of instruments; applied geometry; orthographic projections; dimensioning; sectional views; threads and fasteners; tolerances; working drawings; reproduction of drawings; graphs and charts; simple nomographs.

1 lecture, 5 laboratory hours a week, first semester.

C.E. 100b. **Descriptive Geometry:** Orthographic projection; auxiliary and oblique views; graphical solutions of problems involving points, lines and planes; intersections of solids and development of surfaces.

1 lecture, 3 laboratory hours a week, second semester.

C.E. 101. **Engineering Mechanics:** Course dealing with the principles of statics and dynamics such as composition and resolution of forces; equilibrium of force systems; kinematics and kinetics of rigid bodies; work and energy; impulse and momentum. A variety of applications to engineering problems will be studied in the laboratory.

2 lectures, 1 laboratory hour a week.

C.E. 200y. **Graphic Statics:** Composition and resolution of forces; equilibrium polygon through two and three points; Maxwell diagram; Williot-Mohr diagram.

3 laboratory hours, alternate weeks.

C.E. 201. **Mechanics of Materials:** Study of stress-strain relations, elastic and inelastic behaviour of materials; tension and compression members, members subject to bending, torsion, combined stresses, repeated loads and dynamic loads. Laboratory includes operation and calibration of testing machines; use of various types of strain-measuring instruments; standard procedures in conduct of tension, compression, flexure, torsion, impact and hardness tests.

2 lectures a week; 3 laboratory hours alternate weeks.

C.E. 201x. **Mechanics of Materials:** Same description as C.E. 201, but without laboratory.

2 lectures a week.

C.E. 202. **Surveying and Photogrammetry:** Surveying as applied to engineering; determining distance; angular measurement; bearings; differential levelling; adjustment of instruments; traverses; topographic surveying; hydrographic surveying; earthwork; curves; triangulation; control surveys; field astronomy, and elements of aerial photogrammetry. Field problems and office computations are provided in the laboratory periods to supplement the lectures.

3 lectures, 3 laboratory hours a week.

C.E. 300. **Structural Analysis and Design I:** Determinancy of structures; analysis of statically determinate beams, frames and trusses, influence lines; maximum stress criteria; approximate analysis of frames; slope and deflection of beams; frames and trusses. Laboratory includes design of members in tension, compression and bending, riveted and welded connections; preparation of drawing.

2 lectures, 3 laboratory hours a week.

C.E. 302. **Hydrology:** The hydrologic cycle; quantitative study of precipitation: types, variations, storm rainfall, intensity-duration-frequency; evapo-transpiration losses; groundwater and infiltration; runoff, characteristics, variation, weather and flood control; flood flows, rational method; unit graph and others; flood routing; water quantity determination for public and industrial purposes.

Summer camp (hydrometry).

2 lectures a week, first semester;
1 lecture a week, second semester;
3 laboratory hours alternate weeks, both semesters.

C.E. 303. **Soil Mechanics:** Physical and mechanical properties of soils, classification tests, shear strength, consolidation, permeability, seepage, frost action and compaction. Settlement analysis; stability of slopes in cuttings and embankments; bearing capacity of soils; principles of the design and construction of earth dams; laboratory includes analysis of soil properties, and soil strength. Site investigation, including field identification of soil types and sampling operations.

2 lectures a week, 3 laboratory hours alternate weeks.

C.E. 304. **Reinforced Concrete:** Stresses analysis and design of reinforced concrete beams and columns; combined bending and axial load; ultimate strength and analysis; different floor systems of reinforced concrete building; introduction to prestressed concrete. Laboratory includes design problems and tests of physical properties of concrete and its component materials; design of concrete mixes.

2 lectures, 1½ laboratory hours a week.

C.E. 400. **Structural Analysis and Design II.** Analysis of statically indeterminate structures; work and energy; method of consistent deformation; influence lines; design and detail of a plate girder; slope deflection method; method of moment distribution; column analogy; buckling of beams; structural dynamics; laboratory includes design of an industrial building bent and a highway bridge deck with composite construction.

2 lectures, 3 laboratory hours a week.

C.E. 401. **Civil Engineering Camp:** A field course covering secondary triangulation; precise base line measurement; plane table topography; cross sectioning and earth work; and observations for time and azimuth. Field identification of soil types and sampling operation; current-meter measurement. (See Fees, p. 28).

3 weeks.

C.E. 402. Advanced Hydraulics: Flow in pressure conduits in series, parallel branches and network arrangements; design of sanitary and storm sewage systems; uniform and non-uniform flow in open channels. Principal types of pumps and turbines and their limitation. Analysis of losses, part-load characteristic curves; servo-mechanism; cavitation, inlet scrolls, diffusers, draft tubes, volutes. Analysis of gravity and arch dams; weirs and outlet structures; selection of water power structures and equipment; study of penstocks; surge tanks; control gates; transmission lines; theory and practice of models; cost and value of water power; typical problems; laboratory tests and inspection trips.

2 lectures, 3 laboratory hours a week.

C.E. 403. Foundation Engineering: Soil Mechanics as applied to foundation engineering, bearing capacity of footings, coffer dams and caissons for bridges and buildings; piers, abutments and sheet piling; earth pressure and the design of retaining walls; pile driving and piled foundations; drainage prior to excavation. Design of road and airport runway foundations.

2 lectures a week, 1 laboratory hour a week.

C.E. 404. Transportation Engineering: Highways: history, economy and finance. Soils in highway foundation, bases, sub-bases, asphalt materials, bituminous and rigid pavements, drainage and earthwork. Capacity, curves, spirals, vertical curves sections, sight distances, intersections, channelization and other details of geometric design. Airports: planning and selection of site, patterns, runways, aprons, taxiways, soils in airport foundation, frost action, drainage design of asphalt and rigid pavement. Railroads: locomotives, truck, ballast section, rails, curves and superelevation turnouts, crossovers, frogs, yards. Waterways: river hydraulics, locks, channels, pipelines, design an construction.

2 lectures a week all year, one tutorial hour, first semester.

C.E. 405. Sanitary Engineering: Municipal water supply; quantity required; quality necessary for the various purposes used; design of treatment plants to obtain the required quality; process of sedimentation; coagulation; filtration; softening; iron removal and sterilization. Sewerage and drainage; health relationships; principles of sewage disposal and treatment; development of rural sanitary facilities. The sanitary engineer's role in public health. The laboratories include chemical analysis of water and sewage; design of water and sewage treatment plants; field trips.

2 lectures, 3 laboratory hours a week.

C.E. 406b. **Construction Methods, Machines:** Preliminary planning; estimating costs; site preparation; construction equipment and capacities for earthworks, rock excavation transportation; pumping, hoisting, conveying and concrete preparation; job management.

2 lectures a week, one semester.

C.E. 410b. **Essay and Seminar:** Detailed literature investigation of a project in civil engineering, the various details of which are to be discussed individually in seminar. The seminar discussions are to be compiled by each student in the form of a written essay to be submitted at the end of the fourth year.

1 lecture, 2 laboratory hours a week, one semester.

Electrical Engineering

Officers of Instruction: H. R. Fletcher, M.A.Sc. (Head); Associate Professor: P. A. V. Thomas, B.Sc. Eng., Ph.D.; Associate Research Professor: S. N. Kalra, B.Sc., M.S., Ph.D.; Assistant Professors: H. P. Hsu, M.S., Ph.D.; H. H. Hwang, B.Sc., M.S., Ph.D.; G. V. Venkatesulu, M.S.E.E.; Instructors: J. J. Huschilt, B.A.Sc.; A. F. Pflanzner, B.A.Sc.; M. Y. M. Yau, B.Eng.

E.E. 200a. **Electrical Fundamentals:** Instantaneous and effective values of current, voltage and power. Phasor algebra. Network analysis. Network theorems. Balanced polyphase circuits. Magnetic circuits.

2 lectures, 3 laboratory hours a week, first semester.

E.E. 201b. **Electrical Machines:** Theory, characteristics and applications of D.C. and A.C. machines.

2 lectures, 3 laboratory hours a week, second semester.

E.E. 202b. **Circuit Analysis I:** Loop and Nodal Analysis. Coupled circuits. Unbalanced polyphase circuits. Simple transients. Magnetic circuits.

2 lectures a week, 3 laboratory hours alternate weeks, second semester.

E.E. 204b. **Electrical Measurements:** Errors of measurements. Statistics and errors. Electrical indicating instruments. Electrical bridges. Standards. Magnetic measurements. Measuring transducers.

2 lectures, 3 laboratory hours a week, second semester.

E.E. 300. **Electromagnetic Theory:** Static electric and magnetic fields, field mapping. Laws of Coulomb, Gauss, Ampere and Faraday. Resistance, capacitance and inductance. Maxwell's equations. Energy storage and energy flow. Wave equation and plane waves.

2 lectures a week, 3 laboratory hours alternate weeks.

E.E. 302. **Circuit Analysis II:** Network Topology and equations. Fourier Analysis and Transform. Laplace Transform. Network functions, pole-zero approach. Two port networks. One port reactive networks. Filters. Signal flow graphs.

4 lectures a week, 3 laboratory hours alternate weeks, first semester.

E.E. 303. **Electrical Energy Conversion I:** Electromechanical energy conversion. D.C. machines. Transformers. Magnetic amplifiers. Induction machines. Fractional-horsepower. A.C. motors. Transfer functions of machines.

2 lectures, 3 laboratory hours a week.

E.E. 305. **Circuits and Electronics:** Vacuum and solid state diodes and their applications. Triode and transistors. Multielement devices. Amplifier circuits and their properties. Oscillators. Amplitude modulation and detection. Instrumentation and special circuits.

2 lectures a week both semesters; 3 laboratory hours alternate weeks, second semester.

E.E. 306a. **Electronics I:** Atomic structure, conduction in solids, electron emission. Vacuum diode, triode, tetrode, pentode and special purpose tubes. Semi-conductor physics, semi-conductor diodes, transistors and controlled rectifiers. Tunnel diodes. Gaseous electronics.

2 lectures a week, 3 laborotory hours alternate weeks, first semester.

E.E. 306b. **Electronics II:** Graphical and linear incremental equivalent analysis of vacuum tube and transistor circuits. Piecewise linear equivalent circuits. Frequency response and compensation of amplifiers. D.C. Amplifiers. Power amplifiers. Feedback. Oscillators. Power supplies.

4 lectures, 3 laboratory hours a week, second semester.

E.E. 403a. **Electrical Energy Conversion II:** Generalized theory of rotating machines. Synchronous machines and A.C. commutating machines. Electromechanical transients. Mechanical and electrical analogues. Machine network analysis.

2 lectures, 3 laboratory hours a week, first semester.

E.E. 407b. **Control Systems:** Control system concepts. System components. Steady-state and transient analysis. Stability. System design: Frequency-response, root-locus and analogue simulation methods.

3 lectures, 3 laboratory hours a week, second semester.

E.E. 408a. **Electrical Transmission:** Field concepts and distributed circuits. Transmission-line equations. Steady-state and transient waves on lossless line. Lossy lines. Transmission efficiency and impedance matching. Graphical methods of transmission line problems.

2 lectures a week, 3 laboratory hours alternate weeks, first semester.

E.E. 409a. **Communications I:** Wide band and band pass amplifiers. Pulse response of amplifiers. Modulation and demodulation circuits. Piecewise linear analysis of electronic circuits.

3 lectures, 3 laboratory hours a week, first semester.

E.E. 409b. **Communications II:** Information transmission. Noise. Communication system: modulation and demodulation, signal to noise ratio and comparative study of different systems.

3 lectures a week, 3 laboratory hours alternate weeks, second semester.

E.E. 410b. **Essay and Seminar:** Detailed literature investigation of an electrical engineering project given by the student as a seminar and as a written essay.

3 laboratory hours a week, second semester.

E.E. 411b. **High Frequency Electronics:** Guided waves. Modes and propagation in rectangular and circular waveguides. Resonators. Microwave generation, detection and measurement. Radiation.

3 lectures a week, 3 laboratory hours alternate weeks, second semester.

E.E. 412a. **Digital Systems:** Digital computer: Basic logic, Storage systems, input-output methods. Digital control systems. Electronic switching elements and application to computer circuits. Multivibrators. Counters. Pulse generators.

3 lectures a week, 3 laboratory hours alternate weeks, first semester.

E.E. 414b. **Power Systems:** Power transmission lines. System analysis. Protective systems.

3 lectures a week, 3 laboratory hours alternate weeks, second semester.

Mechanical Engineering

Officers of Instruction: Associate Professors: W. G. Colborne, M.Sc. (Head); G. T. Csanady, Dipl.Ing., Ph.D.; Assistant Professors: H. J. Tucker, M.Eng.; Rev. A. R. Howell, C.S.B., S.T.B., M.A.Sc.; Lecturer: G. B. Babiy, M.Sc.

M.E. 200a. **Kinematics and Dynamics:** Kinematics and dynamics of the plane motion of rigid bodies and of relative motion. Velocity and acceleration analysis of mechanisms.

2 lectures and 3 laboratory hours per week, first semester.

M.E. 200b. **Mechanics of Machinery:** Static and inertia forces in mechanisms, detailed analysis of the reciprocating engine. Kinematics of the cam and follower mechanism. Gear tooth profiles, gear trains. Balancing of rotating and reciprocating masses.

2 lectures and 3 laboratory hours per week, second semester.

M.E. 300a. **Fundamentals of Fluid Mechanics:** Fluid properties and definitions, fluid statics, manometers, flow concepts—continuity, energy equations, Euler's and Bernoulli's equations, momentum principles, flow measurement, viscous effects—laminar flow, Reynolds number, drag forces, boundary layer mechanics (laminar and turbulent), flow in pipes.

2 lectures a week and 3 laboratory hours alternate weeks, first semester.

M.E. 300ax. **Fundamentals of Fluid Mechanics:** Same as M.E. 300a, but without laboratory.

M.E. 300b. **Fluid Mechanics:** Statics—forces on submerged surfaces, dimensional analysis, compressible flow, flow in closed conduits,—non-circular cross-sections, unsteady flow, flow in open channels.

2 lectures a week and 3 laboratory hours alternate weeks, second semester.

M.E. 301a. **Elasticity:** Energy methods in elasticity theory; some problems involving flexure of beams and plates; axially symmetrical stress systems.

2 lectures and 2 laboratory hours a week, first semester.

M.E. 301b. **Vibrations:** Vibrations with one degree of freedom; vibrations of shafts and beams carrying discrete loads; vibrations of elastic bodies.

2 hours lectures and 3 laboratory hours alternate weeks, second semester.

M.E. 303. **Introduction To Thermodynamics:** Fundamental concepts, first law, physical properties, ideal gases, real gases, the second law, reversible and irreversible processes and cycles, consequences of the second law, entropy, physical properties II, availability and irreversibility, gas and gas-vapour mixtures, chemical reactions: combustion.

2 lectures a week, 3 laboratory hours alternate weeks. Text: Engineering Thermodynamics, by Jones and Hawkins.

M.E. 304. **Principles of Heat Transfer:** Fourier equation, steady and transient state conduction, forced and natural convection, boiling, heat transfer inside and outside of tubes, radiation, heat exchangers with solutions of practical problems.

2 lectures a week first semester; 3 lectures a week second semester; 3 laboratory hours alternate weeks. Text: Heat Transfer by A. J. Chapman.

M.E. 305b. **Introduction to Heat Transfer:** Fourier Equation, steady state conduction, steady state conduction in bodies with heat sources, forced and natural convection, simple heat exchangers, heat transfer by radiation.

2 lectures, 3 laboratory hours alternate weeks, one semester.

M.E. 401. **Machine Design:** The principles of machine design and the design of machine elements. Elements treated are: shafts, couplings, clutches and brakes, power screws, gears, lubrication and bearings, flexible machine elements and springs.

2 lectures and 3 laboratory hours a week.

M.E. 402. **Internal Combustion Engines:** Engine types and operation,—aircraft, automotive and marine, theoretical cycles, engine testing, fuels and combustion, combustion charts, carburation and injection, ignition systems, valves and valve mechanisms, design problems.

2 lectures a week, 3 laboratory hours alternate weeks.

M.E. 403. **Engineering Thermodynamics:** Steam power cycles, air compression, refrigeration and applications to air conditioning, gas power cycles, internal combustion engine power plants, thermodynamics of incompressible and compressible fluid flow.

2 hours lectures and 3 hours laboratory per week.

M.E. 404. **Heating and Air Conditioning:** Physiological principles, heating and cooling loads, heating and cooling methods and equipment, air systems, steam and water systems, fuels, chimney and draft calculation, refrigeration, evaporative cooling, cooling towers, industrial ventilation.

2 lectures a week, 3 laboratory hours alternate weeks.

M.E. 405. **Power Plant Engineering:** Application of the laws of thermodynamics, fluid flow, and heat transfer to the economic conversion of energy. Topics include, stationary power plants, nuclear power plants, and more recent development in energy conversion for powering space vehicles.

2 lectures a week, 3 laboratory hours alternate weeks.

M.E. 406a. **Theory of Non-Viscous Fluids:** Basic equations of perfect fluid flow in 3 dimensions, conservation of circulation, examples of potential flow, vortex motion, two-dimensional flow in greater detail, aerofoil theory in two and in three dimensions, influence of compressibility.

2 hours lectures and 3 hour alternate week laboratory, first semester.

References: Lamb: Hydrodynamics

Prandtl, Tietjens: Fundamentals of Hydro and Aeromechanics.

Duncan, Thom and Young: The Mechanics of Fluids.

M.E. 406b. **Turbomachines:** Performance characteristics and similarity principles, cavitation, applications of compressible flow theory and thermodynamic principles, momentum and energy relations, Kutta-Joukowski theorem, Reynolds stresses, energy transfer in a turbomachine, cascade mechanics.

2 lectures, 3 laboratory hours second semester.

M.E. 407b. **Control Theory:** Analysis and synthesis of open loop and feedback control systems and components, dynamic behaviour of systems, transfer functions of systems and components, design of control systems considering stability and response, relations between Laplace transforms, frequency response and root-loci methods, design using computer techniques.

3 lectures a week, 3 laboratory hours alternate weeks, second semester.

M.E. 410a. **Essay and Seminar:** A written essay is required of each student and shall be submitted in the first semester. The essay may be based on an engineering problem encountered during summer employment or any other engineering topic in which the student has an interest. The topic selected and the proposed outline must be approved by the Department Head before the essay is started. The class hours shall be used for the presentation of the essay plus other selected projects.

3 seminar hours a week, first semester.

SEMESTER-HOUR EQUIVALENTS

The following list has been compiled for the convenience of evaluating committees in institutions which employ a credit system. For evaluation of subjects in the Faculty of Arts and Science, see p. 195.

Engineering

ES200 4
ES300 7
ES310a.....4
ES400 6
ES401 4
GE101.....
GE102 .....
GE400b.....2
ChE200.....5
ChE300b 2
ChE301.....7
ChE302.....7
ChE303a 1
ChE401.....6
ChE402.....4
ChE404.....4
ChE410y 2
CE100a 3
CE100b 3
CE101 5
CE200y.....2
CE201 6
CE201x 4
CE202 9
CE300 7
CE302 5
CE303 6
CE304 6
CE400 7
CE401 3
CE402 7
CE403 5
CE404 4
CE405 6
CE406b.....2
CE410b.....2
EE200a, EE201b 7
EE202b.....3
EE202b, EE204b 7
EE300 6
EE302 5
EE303 7
EE305 5
EE306a, EE306b 7
EE403a 4
EE407b 5
EE408a 3
EE409a, EE409b 8
EE410b.....2
EE411b 4
EE412a.....4
EE414b 4
ME200a, ME200b 7
ME300ax 2
ME300a, ME300b 3
ME301a 3
ME301b 3
ME303 6
ME304 7
ME305b 3
ME401 7
ME402 6
ME403 7
ME404 6
ME405 6
ME406a 4
ME406b 3
ME407b 4
ME401a 2

THE FACULTY OF GRADUATE STUDIES

University Library

THE FACULTY OF GRADUATE STUDIES

Faculty Council

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G. R. Horne, Ph.D. Director of the School of Business Administration.

Maurice Adelman, Ph.D., Professor and Head, Department of Chemical Engineering.

W. G. Benedict, Ph.D., Associate Professor of Biology.

L. L. Campbell, Ph.D., Associate Professor of Mathematics.

V. C. Chrypinski, Ph.D., Associate Professor of Political Science.

W. G. Colborne, M.Sc., Associate Professor and Head, Department of Mechanical Engineering.

J. N. Deck, Ph.D., Assistant Professor of Philosophy.

Rev. R. C. Fehr, C.S.B., Ph.D., Associate Professor and Head Department of Psychology.

H. R. Fletcher, M.A.Sc., Assistant Professor and Head Department of Electrical Engineering.

H. P. Herbich, D.Sc., Professor and Head, Department of Civil Engineering.

H. H. G. Jellinek, Ph.D., Professor and Head, Department of Chemistry.

Lucjan Krause, Ph.D., Associate Professor and Head, Department of Physics.

Rev. D. J. Mulvihill, C.S.B., Ph.D., Professor and Head, Department of History.

J. F. Sullivan, Ph.D., Associate Professor of English.

Admissions Committee (Arts, Science, Commerce):

The Dean of Graduate Studies, the Dean of Arts and Science, the Executive Vice-President, the Registrar, the Head of the Department concerned, or delegate.

Admissions Committee (Applied Science):

The Dean of Graduate Studies, the Dean of Applied Science, the Executive Vice-President, the Registrar, the Head of the Department concerned or delegate.

Officers of Instruction

(The year of first appointment to the University is given).

John Abramowich; B.Sc. (Alberta), M.A. (Toronto), Ph.D. (California). Assistant Professor of Mathematics—1960.

Maurice Adelman; B.A.Sc. (Toronto), M.A.Sc. (ibid.), Ph.D. (ibid.). Professor and Head, Department of Chemical Engineering —1956.

Rev. Elliot B. Allen, C.S.B.; B.A. (Toronto), M.A. (ibid.), M.S.L. (Pont. Inst. of Med. Studies), Ph.D. (Toronto). Associate Professor of Philosophy—1962.

Haralambos A. Apostolopoulos; B.Civ.Eng. (Minnesota), M.S.C.E. (ibid.). Assistant Professor of Civil Engineering—1960.

Lucio Artiaga; B.A. (Zaragoza), M.Sc. (Dalhousie). Assistant Professor of Mathematics—1962.

George Borys Babiy; B.Sc. (Manitoba), M.Sc., M.E. (ibid.). Assistant Professor of Mechanical Engineering—1960.

Winfred Gerald Benedict; B.S.A. (Toronto), Ph.D. (ibid.). Associate Professor of Biology—1957.

Robert Gordon Billinghurst; B.A.Sc. (Toronto), M.A.Sc. (ibid.). Associate Professor of Chemical Engineering—1957.

Cecil Mackintosh Birch; B.A. (Western Ontario), M.A. (Toronto), Ph.D. (ibid.). Associate Professor of Business Administration —1959.

Rev. Frank John Boland, C.S.B.; B.A. (Toronto), M.A. (Detroit), Ph.D. (Ottawa). Associate Professor of History—1955.

John Maxwell Brownlie; B.A. (Western Ontario), M.B.A. (Michigan). Assistant Professor of Business Administration—1958.

*Rev. John Francis Callaghan, C.S.B.; B.A. (Toronto), M.A. (ibid.). Assistant Professor of Economics—1957.

Louis Lorne Campbell; B.Sc. (Manitoba), M.S. (Iowa State College), Ph.D. (Toronto). Associate Professor of Mathematics —1958.

Vladimir Bohdan Cervin; B.A. (Vienna), B.Sc. (ibid.), D.S.S. (Brussels), Ph.D. (Prague). Associate Professor of Psychology —1961.

Eric Wyllis Channen; B.A. (Hons.) (Toronto), Ph.D. (ibid.). Assistant Professor of Chemistry—1960.

*On leave, 1962-63.

ASSUMPTION UNIVERSITY LIBRARY

Vincent Casmere Chrypinski; M.L. (Catholic U. of Lublin (Poland)), M.A. (Wayne), Ph.D. (Michigan). Associate Professor of Political Science—1957.

William George Colborne; B.Sc. (Queen's), M.Sc. (ibid.). Associate Professor and Head, Department of Mechanical Engineering —1958.

Rev. Cornelius Patrick Joseph Crowley, C.S.B.; B.A. (Toronto), M.A. (Michigan), Ph.D. (ibid.). Dean of Graduate Studies, 1959. Professor and Head, Department of English—1944.

Gabriel Tibor Csanady; Dipl.Ing. (Munich), Ph.D. (N.S.W.U.T.). Associate Professor of Mechanical Engineering—1961.

Stanley B. Cunningham; B.A. (Manitoba), M.A. (Toronto). Lecturer in Philosophy—1961.

John Norbert Deck; B.A. (Western Ontario), M.A. (ibid.), Ph.D. (Toronto). Assistant Professor of Philosophy—1957.

Robert Joseph Doyle; B.A. (Western Ontario), M.A. (ibid.), M.S. (Michigan State), Ph.D. (Wayne State). Associate Professor of Biology—1948.

Douglas Donald Duquette; B.A. (Western Ontario), M.S. (Michigan State), B.S. (ibid.). Assistant Professor of Civil Engineering —1952.

Hermes Andrew Eliopoulos; B.Sc. (Salonika, Greece). M.Sc. (McGill), Ph.D. (Toronto). Associate Professor of Mathematics —1956.

Zbigniew Marian Fallenbuchl; B.Sc. (London), M.A. (Montreal), Ph.D. (McGill). Associate Professor of Economics and Acting Head, Department of Economics and Political Science—1959.

John Kevin Anthony Farrell; B.A. (Western Ontario), M.A. (ibid.), Ph.D. (Ottawa), F.R.S.A. Assistant Professor of History—1962.

Rev. Donald Thomas Faught, C.S.B.; B.A. (Toronto), M.A. (Michigan). Associate Professor and Head, Department of Mathematics—1954.

Rev. Robert Charles Fehr, C.S.B.; B.A. (Toronto), M.A. (Detroit), Ph.D. (Fordham). Associate Professor and Head, Department of Psychology—1951.

Harold Ross Fletcher; B.A.Sc. (Toronto), M.A.Sc. (ibid.). Assistant Professor and Head, Department of Electrical Engineering —1958.

Patrick Francis Flood; B.A. (Western Ontario), M.A. (ibid.). Associate Professor and Head, Department of Philosophy—1945.

John Blake Gertz; B.S. (Detroit), M.B.A. (Ohio State). Assistant Professor of Business Administration—1957.

William John Gillen; B.A., M.A. (Toronto). Assistant Professor of Economics—1959.

Alex William Gnyp; B.A.Sc. (Toronto), M.A.Sc. (ibid.), Ph.D. (ibid.). Associate Professor of Chemical Engineering—1958.

Joseph Martin Graham; B.A. (Western Ontario), M.A. (ibid.), Ph.D. (Notre Dame). Assistant Professor of Philosophy—1959.

Rev. Alexander John Grant, C.S.B.; B.A. (Toronto), M.A. (St. Bonaventure). Professor and Head, Department of Biology—1945.

Edwin Emile Habib; B.Sc. (Birmingham), Ph.D. (McMaster). Assistant Professor of Physics—1959.

Wilfred Hanson; B.Comm. (Saskatchewan), M.B.A. (Western Ontario). Assistant Professor of Business Administration—1958.

James Paul Hartt; B.A.Sc. (Toronto), O.L.S., M.S.C.E. (Wayne State). Assistant Professor of Civil Engineering—1958.

Nigel Edward Hedgecock; B.A. (British Columbia), M.A. (ibid.), Ph.D. (McMaster). Assistant Professor of Physics—1961.

Henryk Pawel Herbich; Dipl. Ing. (Warsaw), D.Sc. (Eng.) (Edinburgh). Professor and Head, Department of Civil Engineering —1959.

William John Holland; B.Sc. (Queen's), M.Sc. (Wayne), Ph.D. (ibid.). Assistant Professor of Chemistry—1960.

Frank Holuj; B.Sc. (London, England), M.Sc. (McMaster), Ph.D. (ibid.). Assistant Professor of Physics—1961.

Gilbert Richard Horne; B.A. (Western Ontario), M.A. (Michigan), Ph.D. (ibid.). Professor and Director, School of Business Administration—1931.

Rev. Arthur Robert Howell, C.S.B.; B.Sc. (Saskatchewan), S.T.B. (St. Michael's, Toronto), M.A.Sc. (Toronto). Assistant Professor of Mechanical Engineering—1958.

Hwei Piao Hsu; B.S. (National Taiwan U.), M.S. (Case Inst. of Technology), Ph.D. (ibid.). Assistant Professor of Electrical Engineering.

John Huschilt; B.A. (Toronto), M.A. (ibid.), Ph.D. (Wayne State). Assistant Professor of Physics—1953.

Hu Hsien Hwang; B.Sc. (National Chiao-Tung (Shanghai)), M.S. Lehigh), Ph.D. (ibid.). Assistant Professor of Electrical Engineering—1959.

Hans H. G. Jellinek; Ph.D. (London, Imperial College), Ph.D. (Cambridge). Professor and Head, Department of Chemistry—1959.

Surindra Nath Kalra; B.Sc. (Panjab), M.S. (Illinois), Ph.D. (ibid.). Associate Research Professor of Electrical Engineering—1962.

Rev. George Watka Kosicki, C.S.B.; B.A. (Western Ontario), M.S. (Michigan), Ph.D. (ibid.). Assistant Professor of Chemistry —1956.

Ihor Koszman; B.A. (Columbia), B.S. (ibid.), M.S. (Johns Hopkins), D.Eng. Sc. (ibid.). Assistant Professor of Chemical Engineering—1961.

Aranka Eve Kovacs; B.A. (McMaster), M.A. (Toronto), Ph.D. (Bryn Mawr). Assistant Professor of Economics—1961.

Lucjan Krause; B.Sc. (London, England), M.A. (Toronto), Ph.D. (ibid.), A.Inst.P. Associate Professor and Head, Department of Physics—1958.

Calvin Charles Kuehner; B.Sc. (Ohio State), M.Sc. (ibid.), Ph.D. (ibid.). Associate Professor of Biology—1958.

Eugene D. LeMire; Ph.B. (Detroit), M.A. (ibid.), Ph.D. (Wayne State). Assistant Professor of English—1962.

Howard Douglas McCurdy; B.A. (Western Ontario), B.Sc., M.Sc. (Michigan State), Ph.D. (ibid.). Assistant Professor of Biology —1959.

Eugene Joseph McNamara; A.B. (DePaul), M.A. (ibid.). Assistant Professor of English—1959.

Rev. John Alphonse Malone, C.S.B.; B.A. (Western Ontario), M.A. (Toronto), Ph.D. (Fordham). Associate Professor of Psychology—1959.

Mary J. Manley; B.A. (Western Ontario), M.A. (Yale), Ph.D. (ibid.). Associate Professor of English—1952.

Sr. Marian Dolores, S.N.J.M.; B.A. (Marylhurst), M.A. (Loyola, Chicago), Ph.D. (ibid.). Visiting Professor of Psychology —1959.

Reginald Albert Moore; B.Sc. (McMaster), M.Sc. (ibid.), Ph.D. (Alberta). Assistant Professor of Physics—1962.

Marie Lucille Moss; B.S. (Nebraska), M.S. (Minnesota). Assistant Professor of Biology—1955.

Rev. Daniel Joseph Mulvihill, C.S.B.; B.A. (Western Ontario), M.A. (Michigan), Ph.D. (ibid.). Vice-President, Development. Professor and Head, Department of History—1942.

T. D. Nainan; B.Sc. (Travancore), M.Sc. (Bombay), Ph.D. (Indiana). Assistant Professor of Physics—1961.

Ralph Carl Nelson; B.A. (DePaul), M.A. (ibid.), Ph.D. (Notre Dame). Assistant Professor of Philosophy—1961.

Robert Joseph Niedzielski; B.S. (Aquinas), M.S. (Illinois), Assistant Professor of Chemistry—1962.

Rev. John Patrick O'Meara, C.S.B.; B.A. (Toronto), M.A. (Wayne State), Ph.D. (Ottawa). Associate Professor of History—1959.

George Arthur Padley; B.A. (Leeds), Dip.Ed. (ibid.), D. de l'U. (Paris). Assistant Professor of English—1960.

Rev. Edward Cecil Pappert, C.S.B.; B.A. (Toronto), M.A. (Detroit), Ph.D. (Ottawa). Director of Extension, 1958. Assistant Professor of English—1950.

Michael Luke Petras; B.Sc., M.Sc. (Notre Dame). Assistant Professor of Biology—1956.

Brother Roger Philip, F.S.C. (William James Overend); B.A. (Toronto), M.A. (ibid.), Ph.D. (Catholic U. of America). Professor Emeritus of Psychology—1956.

*William Gregory Phillips; B.A. (Toronto), M.A. (ibid.), Ph.D. (ibid.). Professor of Economics and Head, Department of Economics and Political Science—1950.

Stanley James Whitworth Price; B.A. (British Columbia), M.Sc. (ibid.), Ph.D. (Edinburgh). Assistant Professor of Chemistry —1959.

Rev. Maurice Adrian Record, C.S.B.; B.A. (Western Ontario), M.A. (Toronto). Associate Professor of Psychology—1952.

*On leave, 1962-63.

Kenneth Gerald Rutherford; B.A. (Western Ontario), Ph.D. (Wayne State). Associate Professor of Chemistry—1958.

Alfred Arthur Smith; B.A. (Queen's), M.A. (ibid.), Ph.D. (McGill) Associate Professor of Psychology—1959.

John Francis Sullivan; B.S. (Detroit), M.A. (ibid.), Ph.D. (Michigan). Associate Professor of English—1958.

Roger Joseph Thibert; B.A. (Western Ontario), M.S. (Detroit), Ph.D. (Wayne State). Associate Professor of Chemistry—1953.

Paul Alexander Vivian Thomas; B.Sc.Eng. (London), Ph.D. (Glasgow). Associate Professor of Electrical Engineering—1962.

Chi Tien; B.S. (National Taiwan U.), M.S. (Kansas State), Ph.D. (Northwestern). Assistant Professor of Chemical Engineering —1959.

Henry J. Tucker; B.Eng. (McGill), M.Eng. (ibid.). Assistant Professor of Mechanical Engineering—1960.

Arie van Wijngaarden; B.Sc. (McMaster), Ph.D. (ibid.). Assistant Professor of Physics—1961.

Sadanand Verma; B.Sc. (Patna), M.Sc. (Bihar), Ph.D. (Wayne State). Assistant Professor of Mathematics—1959.

Milorad Nicolas Vuckovic; B.A., M.A. Lecturer in History—1960.

Walter LeRoy White, D.F.C.; B.A. (Western Ontario), M.A. (Toronto). Associate Professor of Political Science—1956.

Tze Sun Wu; B.S. (National Chiao-Tung, Shanghai), M.S. (Washington), Ph.D. (Illinois). Associate Professor of Civil Engineering—1957.

Elias Zakon; Mgr. Phil. (Stefan Batory U., Wilno), Dr. Jur. (ibid.). Associate Professor of Mathematics—1957.

Michael Zin; B.Comm., M.B.A. (Michigan), Ph.D. (ibid.). Associate Professor of Business Administration—1956.

FACULTY OF GRADUATE STUDIES

I. Regulations for the Master's Degree

1. Admission requirements: A candidate for the Master's Degree must be a graduate of a recognized college or university with a good academic record (B standing or its equivalent) in his major subject. Graduates of this or other recognized colleges or universities may be accepted as candidates for the degree after they have presented to the Committee on Admissions for Graduate Studies official evidence of graduation and have satisfied the Head of the Department concerned as to their qualifications. Students lacking such qualifications may be admitted under such conditions as the Graduate Committee on Admissions may determine.

2. Period of Study: The duration of the course will be adjusted individually for each candidate. A minimum of one year in residence will be required of candidates who have graduated from Honours courses. For graduates of general courses and Honours courses in areas other than the graduate specialization desired, a minimum of two years will be required. The content of the first year, which will usually consist of undergraduate courses, will be determined in consultation with the Head of the Department concerned. If more than six hours a week are spent in teaching or other departmental duties, additional time will be required.

3. Course of Study: The choice of subjects must be approved by the Head of the Department in which the student is majoring and by the Dean of Graduate Studies. Each graduate student may be required to undergo training in methodology at the discretion of the Department.

Within one month after a candidate's registration, the Head of his Department shall appoint his committee, to consist of his chief advisor, as chairman, and two others (one of whom shall belong to a department other than the one in which the student is majoring). The Head of the Department will then report to the Faculty Council on the composition of each candidate's committee.

Copies of the candidate's prospectus (outlining the subject of the proposed research) shall be submitted to the Head of his Department and to the Faculty Council at least six months before he proposes to take his final examination.

If a candidate does not maintain a satisfactory standing in all his work, his committee may at any time recommend that he discontinue his course.

4. Language requirements: It is essential that the candidate for the Master's Degree in Arts or in Science have a reading knowledge of at least one language other than English. The language shall be chosen in consultation with the Head of the Department in

which the student is majoring. The candidate must furnish evidence of such reading knowledge by passing an examination conducted by the language department concerned at the commencement of the student's graduate studies. If the nature of a candidate's research makes it desirable, a department may require him to show reading knowledge of a second foreign language.

5. **Thesis:** A thesis, incorporating the results of an investigation in the field of the major subject, is required of candidates for the M.Sc. degree in Biology, in Chemistry, and in Experimental Physics, and of candidates for the M.A. degree who have chosen the first course of studies mentioned below.

The candidate, when requested, shall submit to his chief advisor from time to time portions of his thesis and a complete draft on a date specified by his advisor. He shall make final revisions demanded by his advisor or committee and place THREE typewritten copies of the completed thesis (FOUR copies for M.Sc. candidates) in the hands of his advisor FOUR weeks before convocation. The members of the candidate's committee should sign the thesis, when approved, on a page immediately following the title page. He shall submit with his thesis three (or four) copies of an abstract of not more than three hundred words and three (or four) copies of a vita. The abstract will be bound with the thesis immediately following the certificate of approval; the vita at the end of the work. The candidate should consult the University Librarian regarding its form.

The Head of the Department, in consultation with the chairman of the candidate's committee, may request that a thesis be read by an external examiner.

Candidates will be provided with definite instructions regarding approved methods of typewriting, bibliography, footnotes, etc. An acceptable format may be consulted in the University Library. The regulations of the Library as to binding, quality of paper, title page and margins must be fulfilled. Arrangements for binding copies of the thesis shall be made by the candidate with the Librarian and the fee of $4.00 a copy for binding paid to the Library. If the candidate wishes to have an additional copy bound for his own use, the Librarian will make the necessary arrangements on the payment of an additional $4.00.

If approved, the thesis shall become the property of the University. Two copies of the thesis, the original and the first carbon copy, will be filed in the University Library and one copy (or two copies) in the Department.

The regulations contained herein concerning the thesis apply, **mutatis mutandis**, to the major paper required of candidates.

6. Examinations: A department may require oral or written examinations or both and may decide in the case of the individual candidate the type of examination required. A department may, at its discretion, require a comprehensive examination.

Notice of the type of examination shall be given by the Head of the Department to the candidate at least two months before the date on which the examination is to be held.

Each candidate who writes a thesis or major paper shall be required to appear before the Faculty Council of Graduate Studies for an oral examination on his thesis or major paper. The candidate's committee will conduct the oral examination with the committee chairman acting as chairman of the examination. A candidate must obtain a standing of at least 66% on his thesis as well as on all written and oral examinations in his major subjects. A candidate for the Master's degree who does not obtain 66% in any course may repeat the course once only, and he may not repeat more than one course.

Each candidate for the Master's degree shall be required to appear before the Faculty Council of Graduate Studies for an oral examination on his thesis, or in cases where no thesis has been written, on the candidate's field. The candidate's committee will conduct the oral examination with the committee chairman acting as chairman of the examination. A candidate must obtain a standing of at least 66% on his thesis as well as on all written and oral examinations in his major subjects.

The Master's degree with Honours may be granted to a candidate on the recommendation of the committee in charge of the candidate's research and with the approval of the Faculty Council of Graduate Studies. It will be granted not on the basis of any specific percentage but only in recognition of outstanding achievement.

7. Graduation: In order to allow the necessary time for the printing of the diploma and the Convocation program, the candidate's completed work must be approved by the Faculty Council of Graduate Studies and his thesis accepted by the Library two weeks before Convocation.

8. Fees: Before a candidate is eligible for his degree he must have paid his complete tuition fee, and the fee of $4.00 a copy to the Library for the binding of his thesis.

9. Departmental Regulations: The various departments of the University may enforce additional regulations which have been approved by the Faculty Council of Graduate Studies. See pp. 238 ff for these particular requirements.

II. Regulations for the Doctor's Degree

For particular requirements for the degree of Doctor of Philosophy, see pp. 247, 254, 261.

DEPARTMENT OF ECONOMICS AND POLITICAL SCIENCE

Professor:	*W. G. Phillips, Ph.D.
Associate Professor:	V. C. Chrypinski, Ph.D. Z. M. Fallenbuchl, Ph.D. W. L. White, M.A.
Assistant Professors:	*Rev. J. F. Callaghan, C.S.B., M.A. W. J. Gillen, M.A. A. E. Kovacs, Ph.D.

*On leave, 1962-63.

The Master of Arts Degree

At the graduate level students will be expected to specialize in either Economics or Political Science. With the consent of the Department, however, a student specializing in either one of these fields may be permitted to take one graduate course in the other.

The graduate credit courses do not necessarily cover all of the material required for the Comprehensive Oral Examination. In addition all candidates are expected to prepare themselves, under the direction of a member of the Department, for the examination; and each will follow a course of reading recommended by his chief advisor, taking into consideration the subject of his thesis and his individual standing. Students who are required to take the "preparatory year" will start these studies in that year.

Particular requirements:

(a) A thesis on some research subject approved by the Department.

(b) A comprehensive oral examination in Economic Theory (including History of Economic Thought, Microeconomic and Macroeconomic Theory), and two other fields chosen from the following: Economic Policy, Economic History, Money and Banking, Labour Economics, International Economics, Public Finance, Economic Systems.

OR

A comprehensive oral examination in Political Theory and two other fields chosen from the following: International Politics, Canadian Government, Comparative Western European Systems, Soviet and Eastern European Governments and American Government.

(c) The completion of two or three graduate credit courses each with at least 66% standing. The number of courses must be decided in consultation with the Department.

(d) For language requirement, see p. 237.

I. Economics

501. **Macroeconomics:** Neo-Classical, Marxist, Schumpeterian, Swedish, Keynesian and Post-Keynesian macroeconomic theories; determinants of the general levels of production, income, employment and prices; economic growth and fluctuations; conditions of economic progress; policies for economic growth and stability in mature and underdeveloped countries. (Prerequisite: Economics 406a and 406b). Professor Fallenbuchl.

2 hours a week (half year lectures, half year seminars).

510. **International Economics:** The theory of international economic policy; the interrelation between internal and external balance; economic growth and the balance of payments; international economic institutions; international aspects of economic development and anti-cyclical policies. (Prerequisite: Economics 301.) Professor Fallenbuchl.

2 hours a week (half year lectures, half year seminars).

520. **Labour Economics and Collective Bargaining:** The economic, social and legal background of bargaining in selected industries. (Prerequisite: Economics 336.) Professors Gillen and Kovacs.

2 hours a week (seminar).

530. **Economic Concentration:** An advanced study of the theory and institutional development of monopoly and monopolistic competition and government regulatory policies. (Prerequisite: Economics 221.) Professor Phillips.

2 hours a week (seminar).

II. Political Science

501. **Modern Political Thought:** A critical study of selected theories which have influenced modern political philosophy. (Prerequisite: Political Science 452.) Professor Chrypinski.

2 hours a week (seminar).

510. **Problems in Canadian Government:** The development of Canadian autonomy, and its effect on the various institutions of government. (Prerequisite: Political Science 220.) Professor White.

2 hours a week (seminar).

DEPARTMENT OF ENGLISH

Professor: Rev. C. P. J. Crowley, C.S.B., Ph.D., Head of the Department.

Associate Professors: Mary J. Manley, Ph.D.
John F. Sullivan, Ph.D.

Assistant Professors: E. D. LeMire, Ph.D.
Rev. E. C. Pappert, C.S.B., Ph.D.
Eugene J. McNamara, A.M.
G. A. Padley, Dip.Ed., D.del'U.

The Master of Arts Degree

Particular requirements:

Either: (i) At least two and not more than three graduate courses, one of which may be in a cognate field, plus a thesis;
Or: (ii) Three graduate courses, one of which must be a seminar course including a major paper upon which there shall be an oral examination.

501—Tutorial: Instructors to be assigned.
540—Major non-Chaucerian Middle English works and topics.
550—English Linguistics.
555—Chaucer and His Age.
560—Literary Criticism; principles and history to 1900.
561—Literature of the Renaissance (Non-Dramatic).
566—Renaissance Drama.
580—The Eighteenth Century.
585—The Romantic Period.
591—The Victorian Period.
595—American Literature.
597—Literature of Canada.
598—Contemporary Literary Criticism: theory and practice.
599—Recent Literature.

DEPARTMENT OF HISTORY

Professor: Rev. D. J. Mulvihill, C.S.B., Ph.D., Head of the Department.

Associate Professors: Rev. F. J. Boland, C.S.B., Ph.D.
Rev. J. O'Meara, C.S.B., Ph.D.

Assistant Professor: J. K. A. Farrell, Ph.D.

Lecturer: M. Vuckovic, M.A.

The Master of Arts Degree

Particular requirements:

Either: (i) At least two and not more than three graduate courses, one of which may be in a cognate field, plus a thesis;
Or: (ii) Three graduate courses, one of which must be a seminar course including a major paper upon which there shall be an oral examination.

510—Historical Method, Historiography and Bibliography.

520—History of Canada, 1867-1945.

525—Canadian-American Relations 1785 to Present.

530—British Political and Social Thought from 1832-1914. A seminar and selected reading course.

540—American Political and Social Thought from 1820 to 1930. A seminar and selected reading course.

550—Intellectual History of Russia. The Byzantine tradition; development and influences of Russian thought from 1801 to 1956. A seminar and selected reading course.

In special cases, seminars in other areas may be required and will be given by the members of the Department.

DEPARTMENT OF PHILOSOPHY

Associate Professors: Patrick Francis Flood, M.A., Head.
Rev. E. B. Allen, C.S.B., Ph.D.

Assistant Professors: John N. Deck, Ph.D.
Joseph Martin Graham, Ph.D.
R. C. Nelson, Ph.D.

Lecturer: S. B. Cunningham, M.A.

The Master of Arts Degree

Particular requirements:

Either: (i) At least two and not more than three graduate courses, one of which may be in a cognate field, plus a thesis;

Or: (ii) Three graduate courses, one of which must be a seminar course including a major paper upon which there shall be an oral examination.

551—Problems in Metaphysics.

552—Texts of St. Thomas Aquinas.

553—History of Ancient Western Philosophy.

554—Problems in History of Mediaeval Philosophy.

555—Problems in History of Modern Thought.

556—Philosophy of Education.

557—Problems in Social Philosophy.

558—Problems in Practical Philosophy.

DEPARTMENT OF PSYCHOLOGY

Associate Professors: Rev. R. C. Fehr, C.S.B., Ph.D., Head of Department.
V. B. Cervin, Ph.D.
Rev. J. A. Malone, C.S.B., Ph.D.
Rev. M. A. Record, C.S.B., M.A.
A. A. Smith, Ph.D.

Professor Emeritus: Brother R. Philip, F.S.C., Ph.D.

Visiting Professor: Sister Marian Dolores, S.N.J.M., Ph.D.

The course of study will be at least two and not more than three graduate credit courses, one of which may be in a cognate field, and a thesis.

The Master of Arts Degree

Particular requirements:

510—Advanced Experimental Psychology.
520—Research Methods in Psychology.
530—Modern Theories of Psychology.
540—Psychoanalysis and Related Fields.
550—Advanced Projective Techniques.
560—Counselling and Psychotherapy.
570—Clinical Practicum.
580—Advanced Social Psychology.

DEPARTMENT OF BIOLOGY

Professor: Rev. A. J. Grant, C.S.B., M.A., Head of Department.

Associate Professors: W. G. Benedict, Ph.D.
R. J. Doyle, Ph.D.
C. C. Kuehner, Ph.D.

Assistant Professors: H. D. McCurdy, Ph.D.
M. L. Moss, M.S.
M. L. Petras, M.Sc.

The Master of Science Degree

Particular requirements:

In addition to the general requirements listed on pages 237ff. for the Master's degree, the candidate shall (1) successfully complete three full courses, one of which may be selected from a cognate field, (2) conduct a seminar each year of his registration, and (3) pursue original research work and embody it in a thesis.

Not all of the courses listed will necessarily be offered in any one year.

I BOTANY

540a. **Plant Physiology:** An intermediate course in growth, morphogenesis, translocation and water relations.

2 lectures, 3 laboratory hours per week; one semester (half course).

540b. **Plant Physiology:** An intermediate course in development and photosynthesis.

2 lectures, 3 laboratory hours per week; one semester (half course).

541a. **Plant Pathology:** An intermediate course in the principles of pathogenesis in physiological, bacterial, fungal and virus diseases.

2 lectures, 3 laboratory hours per week; one semester (half course).

541b. **Plant Pathology:** An intermediate course in the study of plant disease control.

2 lectures, 3 laboratory hours per week; one semester (half course).

550y. **Seminar:** Presentation and discussion of brief reviews of current botanical literature.

1 hour per week; (half course).

II MICROBIOLOGY

529a. **Microbial Genetics:** An intermediate course in the genetics of bacteria.

2 lectures, 3 laboratory hours per week; one semester (half course).

529b. **Microbial Genetics:** An intermediate course in the genetics of fungi and protozoa.

2 lectures, 3 laboratory hours per week; one semester (half course).

540a. **Microbial Physiology:** An intermediate course in the cytochemistry, nutrition, metabolism and population kinetics of microorganisms.

2 lectures, 4 laboratory hours per week; one semester (half course).

540b. **Microbial Physiology:** Selected topics in microbial physiology with emphasis on the research techniques employed in the study of microbial metabolism.

1 lecture, 4 laboratory hours per week; one semester (half course).

550y. **Seminar:** Presentation and discussion of brief reviews of current literature in microbiology.

1 hour per week; (half course).

III ZOOLOGY

529a. **Mammalian Genetics:** An advanced course in the genetic control of morphological and biochemical variants, qualitative traits and certain developmental phenomena in mammals.

3 lectures per week; one semester (half course).

529b. **Population Genetics:** An advanced course in the genetics of populations composed of bisexual organisms.

3 lectures per week; one semester (half course).

550y. **Seminar:** Presentation and discussion of brief reviews of current literature in the field of zoology.

1 hour per week; (half course).

DEPARTMENT OF CHEMISTRY

Professors: H. H. G. Jellinek, D.I.C., Ph.D.
Head of Department
F. A. DeMarco, M.A.Sc., Ph.D.

Associate Professors: K. G. Rutherford, B.A., Ph.D.
R. J. Thibert, M.S., Ph.D.

Assistant Professors: E. W. Channen, B.Sc., Ph.D.
W. J. Holland, B.S., M.S., Ph.D.
S. J. W. Price, M.Sc., Ph.D.
Rev. G. W. Kosicki, C.S.B., M.S., Ph.D.
R. J. Niedzielski, M.S., Ph.D.

I. The Master of Science Degree

Particular requirements:

In addition to the general requirements and stipulations listed on pages 237ff. for the Master's degree, the following course requirements must be met by all candidates; the successful completion of at least three and not more than five full courses, one of which must be in a cognate field. A seminar must be taken each year the candidate is registered, and original research work must be pursued and embodied in a thesis. All courses will be selected in consultation with the Department Head to suit the candidate's major field of study.

II. The Doctor of Philosophy Degree

1. **Admission Requirements**
A candidate for the degree of Doctor of Philosophy in Chemistry must be a graduate of a recognized College or University with at least an Honours degree or equivalent in the field of chemistry. He must present official evidence of satisfactory academic standing to the Admissions Committee of the Faculty of Graduate Studies and the Department Head before he can be accepted by the University.

2. **Period of Study**
Normally a minimum of three calendar years' full-time study is required from the Honours degree or equivalent, with at least one year spent in residence, and a minimum of two calendar years from the Master's degree, also with at least one year in residence. No more than seven years should elapse before completion of the Ph.D. course.

3. **Course Work**

Candidates for the Ph.D. degree must successfully complete (B average) the following minimum course work:
(a) Three full graduate courses in the major field.
(b) Two full graduate chemistry courses outside the major field.
(c) Two full courses in a cognate field or fields.
(d) Seminar, to be taken each year the candidate is registered.
No candidate may elect to take more than ten courses, without the consent of the major advisor.
Any candidate who fails to maintain satisfactory standing in all course and thesis work may be asked to withdraw.

4. **Doctoral Committee:**

Within one month after a candidate's registration, the Head of the Department will, in consultation with the Dean of the Council of the Faculty of Graduate Studies, assign his doctoral committee. This committee will consist of six members, three of whom are to be chosen from the Chemistry Department (including the chief advisor), and three from outside the Department (two of whom should be from a cognate field), being appointed by the Dean of the Faculty of Graduate Studies. One of the latter three committee members will be appointed by the chairman to act as moderator of the thesis oral examination and of any meeting called by the Department Head to review a candidate's progress.

5. **Language Requirements:**

A candidate will be expected to demonstrate by written examination a reading knowledge of
(a) German or Russian
(b) another language as approved by the Department Head.
The language examinations will be offered annually in conjunction with the Language Department and must be successfully passed before admittance to the Doctoral Examination.

6. **Thesis:**

A thesis embodying the results of an original investigation in the field of the major subject is required of candidates for the Ph.D. degree.

The candidate, when requested, shall submit to his chief advisor from time to time portions of his thesis and a complete draft on a date specified by his advisor or committee, and place four typewritten copies of the completed thesis in the hands of his advisor at least six weeks before convocation. The members of the candidate's committee must sign the thesis, when approved,

on a page immediately following the title page. The candidate shall submit with his thesis four copies of an abstract of no more than 500 words and four copies of a vita. The abstract will be bound with the thesis immediately following the certificate of approval and the vita at the end of the thesis. An additional abstract is required for national bibliographical purposes. The candidate should consult the University Librarian as to the format of the thesis. Rules governing binding, quality of paper, etc., of thesis can be found on page 238.

7. **Examinations:**

In addition to language examinations and course work, all candidates must meet the following additional requirements: (in certain cases some of these requirements may be waived):

(a) A reasonable mastery of the fundamentals of the major fields of chemistry, tested by a written comprehensive examination to be completed within one year after the student is admitted to the graduate program.

(b) A reasonably mastery of the field of specialization chosen, tested by a Doctoral written examination given normally at the end of the second year of graduate study.

(c) The passing of a final oral examination in defense of the thesis. An examiner from outside the institution chosen by the candidate's major advisor, may be present at the thesis defence at the discretion of the Department Head.

III. Details of Subjects:

Not all of the courses listed will necessarily be offered in any one year. Special topics courses can be taken several times provided the course content is different.

I. Analytical Chemistry

532. **Advanced Analytical Chemistry:** The analysis of alloys, minerals and ores employing titrimetric, gravimetric and instrumental methods. (Prerequisite: Chemistry 332).
2 lectures, 3 laboratory hours a week.

542a. **Instrumental Analysis:** Ultraviolet, visible and infrared spectroscopy; polarography, colorimetry, conductometric titrations, coulometric titrations, electroanalytical methods. (Prerequisite: Chemistry 332).
2 lectures, 3 laboratory hours a week, one semester.

552b. **Special Topics in Analytical Chemistry:** Frontiers in the field of analytical chemistry. (Prerequisite: Chemistry 332).
2 lectures a week; one semester.

562. **Radiochemistry:** Properties and safe handling of radioactive substances. Experiments dealing with the identification and use of various radioactive isotopes and the application of tracer techniques to various fields of chemistry. (Prerequisite: Consent of the instructor).

2 lectures a week, both semesters. 3 laboratory hours a week, one semester.

II. Biochemistry

536. **General Biochemistry:** An introductory course in Biochemistry. (Prerequisite: Chemistry 333).

3 lectures, 3 laboratory hours a week.

536x. Same as Chemistry 536 but without laboratory.

546a. **Intermediate Biochemistry:** A study of enzymes. Literature and/or term paper required. (Prerequisite: Chemistry 536 or equivalent).

3 lectures a week, one semester.

546b. **Intermediate Biochemistry:** A study of hormones. Literature and/or term paper required. (Prerequisite: Chemistry 536 or equivalent).

3 lectures a week, one semester.

556a. **Special Topics in Biochemistry.** (Prerequisite: Chemistry 536 or 536x or equivalent).

3 lectures a week, first semester.

556b. **Special Topics in Biochemistry.** (Prerequisite: Chemistry 536 or 536x or equivalent).

3 lectures a week, second semester.

566a. **Biochemical Research Methodology:** A study of the current methods used in Biochemistry with emphasis on analytical methods.

1 lecture, 3 laboratory hours a week, one semester.

566b. **Biochemical Research Methodology:** A study of the current methods used in Biochemistry with emphasis on analytical methods.

1 lecture, 3 laboratory hours a week, one semester.

III. Inorganic Chemistry

535a. **Chemistry of the More Familiar Elements:** Descriptive chemistry of the more familiar elements and their compounds, with emphasis on the less familiar chemistry thereof, including a discussion of the economic aspects of inorganic chemistry. (Prerequisite: Chemistry 335).

2 lectures a week; one semester.

535b. **Chemistry of the Less Familiar Elements:** Descriptive chemistry of the less familiar elements and their compounds, with emphasis on coordination chemistry. (Prerequisite: Chemistry 335).
2 lectures a week; one semester.

545. **Theoretical Inorganic Chemistry:** Theoretical considerations of the periodic relationships and reactivities of the elements and their compounds, particularly in the light of recent structural, thermodynamic and kinetic data relating to aqueous and non-aqueous solutions, dry state reactions and high temperature chemistry. (Prerequisite: Chemistry 335).
2 lectures a week.

555. **Selected Topics in Inorganic Chemistry:** Topics to be arranged by the instructor based primarily upon new developments in the field as gathered from a study of the current research literature. (Prerequisite: Chemistry 535a and 535b).
2 lectures a week.

IV. Organic Chemistry

533. **Physical Organic Chemistry:** Applications of thermodynamics and kinetics to organic reaction mechanisms. Mass law, ionic strength and salt effects as well as polar and steric effects are discussed from the physiochemical standpoint. (Prerequisite: Chemistry 333, 444 and 464).
2 lectures a week.

543. **Synthetic Organic Chemistry:** A detailed study of organic reactions with particular reference to multistage syntheses. Stereospecific synthesis. (Prerequisite: Chemistry 333).
2 lectures a week.

553a. **Organic Chemistry of High Polymers:** Condensation and addition polymers. Stereospecific polymerization. (Prerequisite: Chemistry 333, 444 and 464).
2 lectures a week; one semester.

553b. **Heterocyclic Compounds:** The chemistry of heterocyclic organic compounds. (Prerequisite: Chemistry 333).
2 lectures a week; one semester.

563. **Natural Products:** The organic chemistry of the steroids, terpenes, vitamins and drugs. (Prerequisite: Chemistry 543).
2 lectures a week.

573a. **Special Topics in Organic Chemistry:** Selected topics of recent interest in the field. (Prerequisite: consent of instructor).
2 lectures a week; one semester.

V. Physical Chemistry

544. **Physical Chemistry of High Polymers:** Kinetics of condensation and addition polymerization. Physical and thermodynamic properties. Degradation of high polymers. (Prerequisite: Chemistry 444 and 464).

2 lectures a week.

554. **Theoretical Chemistry:** Statistical and quantum mechanics. Atomic and molecular spectra. (Prerequisite: Chemistry 444, 454 and 464).

2 lectures a week.

564. **Gas Kinetics:** Theoretical and experimental aspects of gas phase reactions. (Prerequisite: Chemistry 444).

2 lectures a week.

574. **Special Topics in Physical Chemistry:** Selected topics of current interest. (Prerequisite: consent of instructor).

2 lectures a week.

VI. Master's Thesis

VII. 550. Seminar

VIII. Doctoral Thesis

DEPARTMENT OF MATHEMATICS

Associate Professor:	Rev. D. T. Faught, C.S.B., M.A., Head of Department.
	L. L. Campbell, M.S., Ph.D.
	H. A. Eliopoulos, M.Sc., Ph.D.
	A. C. Smith, M.Sc., Ph.D.
	E. Zakon, Dr.jur.
Assistant Professors:	J. Abramowich, M.A., Ph.D.
	Lucio Artiaga, M.Sc.
	S. Verma, M.Sc., Ph.D.
Sessional Instructors:	D. J. Foulis, Ph.D.
	F. K. Schnitzer, Ph.D.

The Master of Science Degree

The course of study shall be either at least four graduate courses, or at least three graduate courses and a major paper upon which there shall be an oral examination.

I. Pure Mathematics

501—Advanced Modern Algebra.
502—Topics in Topology.
503—Group Representations and Spinor Calculus.
504—Mathematical Logic.
505—Advanced Geometry.
506—Introduction to the Differential Geometry in the Large.
507—Functions of a Real Variable.
508—Theory of Integration.
509—Integral Transforms.
510—Partial Differential Equations.
511—Fourier Analysis.

II. Applied Mathematics

550—Advanced Quantum Mechanics and Quantum Field Theory.
551—Group Theory and Quantum Mechanics.
552—Topics in Relativity and Field Theory.
553—Relativistic Celestial Mechanics and Cosmology.
554—Random Noise Theory.
555—Information Theory.
556—Advanced Electromagnetic Theory.
557—Hydro- and Aerodynamics.
558—Mathematical Theory of Elasticity.
559—Equations of Mathematical Physics.
560—Functional Analysis with Applications to Theoretical Physics.
561—Numerical Analysis.
562—Selected Topics in Applied Mathematics for Engineers.

DEPARTMENT OF PHYSICS

Associate Professor: L. Krause, B.Sc., M.A., Ph.D., A.Inst.P.
Head of the Department

Assistant Professors: E. E. Habib, B.Sc., Ph.D.
N. E. Hedgecock, M.A., Ph.D.
F. Holuj, M.Sc., Ph.D.
John Huschilt, M.A., Ph.D.
R. A. Moore, M.Sc., Ph.D.
T. D. Nainan, M.Sc., Ph.D.
A. van Wijngaarden, B.Sc., Ph.D.

The Department provides facilities for students wishing to proceed to the degrees of Master of Science and Doctor of Philosophy. The attention of candidates is drawn to the regulations on page 237 governing admission requirements and the requirements for the Master's degree. The candidates must also satisfy the following additional conditions.

Admission Requirements.

The basic qualification for admission consists of a Bachelor's degree with adequate specialization in Physics, obtained with first or second class honours. Students with deficiences may be permitted to make up these deficiencies by registering initially in a program of undergraduate courses.

I. The Degree of Master of Science

Particular requirements:

The course of study for the degree of Master of Science will consist of at least two and not more than three graduate courses and a thesis. One of the courses may be selected from among undergraduate or graduate courses in a cognate field.

Students proceeding to a degree in theoretical physics may be required to pursue a program consisting of five lecture courses, two of which may be taken in the department of mathematics. In this case no thesis will be expected.

II. The Degree of Doctor of Philosophy

1. **Period of Study.**

A minimum of three years in full-time graduate studies is required. Credit for one of the three years may be given for a Master's degree obtained in this department or for graduate work carried out at another institution. Not more than seven years should elapse between registration and completion of the requirements for the degree; an extension of this period may be granted only on recommendation from the department.

2. **Course Work.**

Candidates will complete a minimum of five graduate courses, of which Physics 550, 631 and 650 are obligatory. Certain courses in mathematics or another science may be accepted for graduate credit if approved by the department. All candidates are expected to participate in departmental seminars.

3. **Doctoral Committee.**

Within one month after registration each candidate will be assigned to an advisory committee consisting of his research advisor and two other staff members in the Department. The committee will, from time to time, review the candidate's progress and will be present at the final oral examination (defence of the thesis). The committee may co-opt an additional member from outside of the University who, as expert in the field of physics in which the candidate's research is carried out, will appraise his thesis and may also be present at the final oral examination.

4. **Language Requirements.**

A reading knowledge of two modern languages is expected. Written language examinations are set annually in conjunction with the Department of Modern Languages of the University and must be passed at least one year before the date of expected graduation.

5. **Thesis.**

In order to qualify for the degree, each candidate must present a thesis embodying the results of an original investigation in a branch of physics. Graduate courses form an important but subsidiary part of the program.

The candidate, when requested, shall submit to his chief advisor from time to time portions of his thesis and a complete draft on a date specified by his advisor and place four typewritten copies of the completed thesis in the hands of his advisor at least six weeks before convocation. The members of the candidate's committee must sign the thesis, when approved, on a page immediately following the title page. The candidate shall submit with his thesis four copies of an abstract of no more than 500 words and four copies of a vita. The abstract will be bound with the thesis immediately following the certificate of approval and the vita at the end of the thesis. An additional abstract is required for national bibliographical purposes. The candidate should consult the University Librarian as to the format of the thesis. Rules governing binding, quality of paper, etc., of the thesis can be found on page 238.

6. **Examinations.**

In addition to the language examinations and examinations in the courses, all candidates must pass qualifying examinations covering the general field of physics at the level of the honours course given in this department. Two three-hour papers are written, usually one year after the commencement of graduate studies. The examinations take place in April and September and must be passed at least one year before the date of expected graduation. Other examinations (written or oral) may be set at the discretion of the department.

Each candidate will, on recommendation of his advisory committee, present himself for a final oral examination in defence of his thesis. This examination will be conducted by a committee which, in addition to the members of the candidate's advisory committee and the external examiner, may include faculty members from other departments. The chairman and extradepartmental members are appointed by the Dean of Graduate Studies in consultation with the Chairman of the Department.

III. Details of Subjects

Not all of the courses listed below will necessarily be offered in any one year.

500. **Seminar.** Selected topics in theoretical physics.

526. **Molecular Physics and Spectroscopy:** Infrared and Raman spectra of diatomic molecules and of simple polyatomic molecules.

534. **Advanced Electronics:** Transmission line theory, microwaves, pulse and digital circuits. Network analysis with Fourier and Laplace transforms.

550. **Quantum Mechanics:** Linear vector space, action principle, formulation of the scattering problem. Born approximation, perturbation theory; partial wave analysis; Pauli spin theory; Dirac equation and spin; radiation theory; dispersion relations.

552. **Atomic Physics and Resonance Phenomena:** Interactions between magnetic fields and atomic energy levels with special reference to electron-spin resonance and optical pumping phenomena.

566. **Solid State Physics:** The study of point groups, Brevais lattices and space groups. Inverse lattices with applications to scattering phenomena. Electric, magnetic and thermal properties of solids; superconductivity and superfluidity. The effects of imperfections and impurities in crystals.

567. **Nuclear Physics:** Nuclear forces, scattering phenomena, nuclear models, electromagnetic interactions of nuclei, beta-decay theory.

631. **Statistical Mechanics:** Basic principles of statistical physics, Gibbs distribution, the perfect gas. Fermi-Dirac and Bose-Einstein distributions. Applications to condensed states, the real gas, phase equilibria, solutions, chemical reactions. Theory of fluctuations; second order phase transitions. (Prerequisite: Physics 550).

650. **Advanced Quantum Mechanics:** Relativistic quantum mechanics; systems with many particles with spin; Lagrangian quantization; introduction to quantum theory of fields; free electromagnetic, meson and spinor fields; photon-electron and pion-nucleon interactions, nuclear potential. Other topics of current interest. (Prerequisite: Physics 550).

Areas of Research.

Candidates proceeding to the degrees of M.Sc. and Ph.D. may carry out research in the following fields:

Problems in atomic collisions and optical pumping (L. Krause), Beta- and gamma-ray spectroscopy (E. E. Habib and T. D. Nainan), Electron-spin resonance in solids (F. Holuj and N. Hedgecock), Interaction of low energy ions with matter (A. van Wijngaarden).

SCHOOL OF BUSINESS ADMINISTRATION

Professor: G. R. Horne, B.A., M.A., Ph.D. (Director).

Associate Professors: C. M. Birch, B.A., M.A., Ph.D.
Michael Zin, B.Comm., M.B.A., Ph.D.

Assistant Professors: J. M. Brownlie, B.A., M.B.A.
J. B. Gertz, B.S., M.B.A.
Wilfred Hanson, B.Comm., M.B.A.

I. The Master of Business Administration Degree

The purpose of the Master of Business Administration program is to provide broad post-graduate studies in the general field of business administration. The graduate student is afforded the opportunity to expand his knowledge of the principal phases of business administration, and thereby be prepared for responsible performance in private business and public service careers.

The general principles of management are emphasized throughout the program; this approach is supplemented by the use of the case method of instruction to bring reality to the studies.

Particular admission requirements:

1. In addition to the admission requirements listed above in (1), p. 237, an applicant for admission to the M.B.A. course who has not completed a formal course in the principles of economics must make up the deficiency.

2. For applicants possessing the Bachelor of Commerce General Degree, or equivalent, a make-up year will be required in which the student will take courses as approved by the Director of the School of Business Administration.

3. Graduates with the Bachelor of Commerce Honours (4 years from Grade XIII) from this or other universities, with second class standing, who have done satisfactory work in all the subjects included in the first year of the Master's program as indicated below, are eligible to complete the degree in one year.

4. Graduates who have done work elsewhere comparable to that included in the first year of the Master's program here will be eligible to enter the second year.

5. A student with a university degree, who has completed the six courses leading to the Certificate in Business Administration (see p. 114) at this University may receive credit for up to four of the five courses required for the first year of the M.B.A. program.

Students are admitted to the second year if they have secured an average of second class honours in the required subjects of the

first year, or have completed the Diploma Course in Management with second class honours.

Evening Students. Provision is made for candidates in full-time employment to spread the work for the degree over a number of years. There is no time limit for the work of the first year but the work of the second year must be covered in not more than four consecutive years. Only two subjects may be taken concurrently by part-time students.

First Year

Bus. Ad. 481ab—Statistical Methods in Business
Bus. Ad. 483ab—Marketing
Bus. Ad. 485ab—Personnel Management, Industrial Relations
Bus. Ad. 489 —Accounting
Bus. Ad. 493 —Corporation Finance

Second Year

Bus. Ad. 500ab—Business Policy
Bus. Ad. 504ab—Administrative Accounting
Three full courses chosen from the following:

Bus. Ad. 502ab—Administrative Problems
Bus. Ad. 506c —Contemporary Business Problems
Bus. Ad. 507c —Production
Bus. Ad. 508ab—Marketing Management and Strategy
Bus. Ad. 510c —International Marketing and Finance
Bus. Ad. 511ab—Investment Analysis and Management
Bus. Ad. 513c —Human Relations in the Industrial Community
Bus. Ad. 514ab—Public Administration
Bus. Ad. 516ab—Statistical Analysis
Bus. Ad. 518c —Accounting Theory—Assets
Bus. Ad. 519c —Accounting Theory—Equities
Bus. Ad. 520c —Financial Management
Bus. Ad. 521c —Capital Budgeting

One subject (for which the student must have the undergraduate qualifications) from other graduate courses, if approved by the Director of the School of Business Administration and the Department concerned.

In addition to the subjects listed, the student is required to prepare a paper on some research subject.

The prerequisite for a second term course is its corresponding first term course.

II. Diploma Course In Management

Upon completion of the first year of the M.B.A. program with at least a "C" average, a student becomes eligible for the Diploma in Management. A "B" average is required for admission to the second year of the M.B.A. program.

III. Details of Subjects

481a. **Statistical Methods In Business I:** The distinction between descriptive statistics and statistical inference, theoretical frequency distributions, measures of location and variation, probability, mathematical expectation, and sampling distributions.

3 hours a week, one semester.

481b. **Statistical Methods In Business II:** Problems of estimations, tests of hypotheses, sampling problems, small samples, regression, correlation, index numbers and time series.

3 hours a week, one semester.

483a. **Marketing Principles And Policies I:** Marketing policy formation and application to problems of consumers, merchandising and channels of distribution.

3 hours a week, one semester.

483b. **Marketing Principles And Policies II:** The management of personal selling and sales promotion, pricing, marketing research and integrated marketing programs.

3 hours a week, one semester.

485a. **Personnel Management:** The practical application of personnel principles and techniques to specific situations by use of the case-study method.

3 hours a week, one semester.

485b. **Industrial Relations:** A case course stressing worker-management relations under unionized conditions.

3 hours a week, one semester.

489. **Accounting:** Accounting concepts and techniques as tools for the administration of the economic activity of the business enterprise.

6 hours a week, one semester.

493. **Corporation Finance:** A basic course in business finance. Taught with emphasis on analysis rather than description with the object of demonstrating principles.

6 hours a week, one semester.

APPLIED SCIENCE

Professors: F. A. DeMarco, Ph.D., Dean of Faculty of Applied Science
M. Adelman, Ph.D., Head of Chemical Engineering
H. P. Herbich, D.Sc., Head of Civil Engineering

Associate Professors: R. G. Billinghurst, M.A.Sc., Head of Engineering Science
W. G. Colborne, M.Sc., Head of Mechanical Engineering
G. T. Csanady, Ph.D., Mechanical Engineering
A. W. Gnyp, Ph.D., Chemical Engineering
P. A. V. Thomas, Ph.D., Electrical Engineering
T. S. Wu, Ph.D., Civil Engineering

Associate Research Professor: S. N. Kalra, M.S., Ph.D., Electrical Engineering

Assistant Professors: H. R. Fletcher, M.A.Sc., Head of Electrical Engineering
H. A. Apostolopoulos, M.S.C.E., Civil Engineering
G. Babiy, M.Sc., M.E., Mechanical Engineering
D. D. Duquette, M.S., Civil Engineering
J. P. Hartt, M.S.C.E., Civil Engineering
Rev. A. R. Howell, C.S.B., M.A.Sc., Mechanical Engineering
H. P. Hsu, Ph.D., Electrical Engineering
H. H. Hwang, Ph.D., Electrical Engineering
I. Koszman, Ph.D., Chemical Engineering
C. Tien, Ph.D., Chemical Engineering
H. J. Tucker, B.Eng., Mechanical Engineering

I. The Master of Applied Science Degree

For General Regulations, see pages 237ff.

Particular Regulations:

1. Admission Requirements

A candidate for the degree of Master of Applied Science shall hold the degree of Bachelor of Applied Science of this University or an equivalent degree in Applied Science or Engineering. (In addition, he must have an average of B standing or its equivalent in his major subjects).

An applicant having a Bachelor's degree in Science or Applied Mathematics may be admitted as a candidate on the recommendation of the Department concerned and subject to the approval of the Faculty of Graduate Studies.

Candidates are urged to apply as early as possible to enable the Committee to evaluate qualifications and work out a program.

2. Period of Study

The duration of the course will be adjusted individually for each candidate. A minimum of one year in residence, or equivalent, will be required. If more than six hours a week are spent in teaching or other departmental duties, additional time will be required. No candidate may be registered for the M.A.Sc. degree for more than eight years.

3. Course of Study

Candidates will be required to complete a minimum of six courses of which one to three may be replaced by a thesis. The thesis may be replaced by an equivalent amount of course work at the discretion of the Department involved, in which case a major paper and/or a comprehensive examination will be required. A "course" shall constitute not less than 50 hours of lectures or the equivalent.

4. Language Requirements

It is not obligatory to take a foreign language for credit but a candidate may be asked to demonstrate a reading knowledge of a foreign language at the discretion of the Department concerned.

5. Particular Examination Requirements

A candidate who does not obtain 66% in any course may repeat the course once only, and he may not repeat more than one course.

The Master's degree with Honours may be granted to a candidate on the recommendation of the committee in charge of the candidate's research and with the approval of the Faculty Council of Graduate Studies. It will be granted on the basis of an average of 80% or more in his graduate work.

II. The Doctor of Philosophy In Chemical Engineering Degree

1. Admission Requirements.

A candidate for the degree of Doctor of Philosophy in Chemical Engineering must be a graduate of a recognized College or University with at least a Bachelor's degree or equivalent in the field of chemical engineering. He must present official evidence of satisfactory academic standing to the Admissions Committee of the Faculty of Graduate Studies and the Department Head before he can be accepted by the University.

2. **Period of Study.**

Normally a minimum of three years' full-time study is required from Bachelor's degree or equivalent, with at least one year spent in residence, and a minimum of two calendar years from the Master's degree, also with at least one year in residence. No more than seven years from commencement of the post-graduate work should elapse before completion of the Ph.D. course.

3. **Course Work**

Candidates for the Ph.D. degree must successfully complete (B average) the following minimum course work:

(a) four full graduate courses in Chemical Engineering.

(b) two full courses in a cognate field or fields.

(c) Seminar, to be taken each year the candidate is registered.

Any candidate who fails to maintain satisfactory standing in all courses and thesis work may be asked to withdraw.

4. **Doctoral Committee.**

Within one month after a candidate's registration, the Head of the Department will, in consultation with the Dean of the Council of the Faculty of Graduate Studies, assign his doctoral committee. This committee will consist of six members, three of whom are to be chosen from the Chemical Engineering Department (including the chief advisor), and three from outside the Department (two of whom should be from a cognate field), being appointed by the Dean of the Faculty of Graduate Studies. One of the latter three committee members will be appointed by the chairman to act as moderator of the thesis oral examination and of any meeting called by the Department Head to review a candidate's progress.

5. **Language Requirements.**

A candidate will be expected to demonstrate by written examination a reading knowledge of German or Russian. The language examinations will be offered annually in conjunction with the Language Department and must be successfully passed before admittance to the Doctoral Examination.

6. **Thesis.**

A thesis embodying the results of an original investigation in the field of the major subject is required of candidates for the Ph.D. degree.

The candidate, when requested, shall submit to his chief advisor from time to time portions of his thesis and a complete draft on a date specified by his advisor or committee, and place four typewritten copies of the completed thesis in the hands of his advisor at least six weeks before convocation. The members of the candidate's committee must sign the thesis, when approved, on a page immediately following the title page. The candidate shall submit with his thesis four copies of an abstract of no more than 500 words and four copies of a vita. The abstract will be bound with the thesis immediately following the certificate of approval and the vita at the end of the thesis. An additional abstract is required for national bibliographical purposes. The candidate should consult the University Librarian as to the format of the thesis. Rules governing binding, quality of paper, etc., of thesis can be found on page 238. The thesis may be submitted to a person expert in the field but at another university, if outside criticism is found to be desirable.

7. **Examinations.**

In addition to a language examination and course work, all candidates must meet the following additional requirements:

(a) A reasonable mastery of the fundamentals of the major fields of chemical engineering, tested by a written comprehensive examination to be completed within one year after the student is admitted to the graduate program.

(b) A reasonable mastery of the field of specialization chosen, tested by a Doctoral Examination given normally at the end of the second year of graduate study.

(c) The passing of a final oral examination in defence of the thesis. An examiner from outside the institution chosen by the candidate's major advisor may be present at the thesis defence at the discretion of the Department Head.

All the following courses will not necessarily be given the same year.

Engineering Sciences

E.S. 501. **Experimental Stress Analysis:** Strain gages and transducers, brittle lacquers and photoelastic methods of stress analysis. Static and dynamic and transient measurements.
2 hours a week. 3 laboratory hours alternate weeks.

Chemical Engineering

Ch.E. 500. **Seminar.**

Ch.E. 501a. **Chemical Engineering Thermodynamics I:** An advanced study of the application of classical thermodynamic principles to chemical engineering practice. Open systems, thermo-

dynamics of flowing systems, phase rule, electrolytic cells, chemical equilibria, and prediction of thermodynamic properties.

3 hours a week, one semester.

Ch.E. 501b. **Chemical Engineering Thermodynamics II:** Thermodynamics of irreversible processes. Formulation of fundamental equations of chemical engineering. A detailed analysis of thermal diffusion. Introduction to the concepts of statistical thermodynamics.

3 hours a week, one semester.

Ch.E. 502a. **Chemical Engineering Kinetics I:** An advanced study of the application of kinetic principles to chemical engineering practice including basic kinetic principles, complex rate equations, approximate solution of complex reactions, heat transfer in batch reactors, continous flow stirred-tank reactors.

3 hours a week, one semester.

Ch.E. 502b. **Chemical Engineering Kinetics II:** A continuation of Ch.E. 502a, dealing with homogeneous tubular reactors, fluid phase reactions catalyzed by solids, catalytic reactor design, uncatalyzed heterogeneous reactions.

3 hours a week, one semester.

Ch.E. 503a. **Mass Transfer:** Definition of concentration, velocity and flux in mass transport processes. Formulation of the equation of change in multicomponent systems. Concentration distribution in laminar and turbulent flow. Interphase mass transfer and definition of mass transfer coefficients.

3 hours a week, one semester.

Ch.E. 504a. **Heat Transfer I:** Derivative of the heat conduction equation. Analytical solution of the conduction equation by the classical method. Numerical and graphical solutions. Discussion of problems involving a change of phase.

3 hours a week, one semester.

Ch.E. 504b. **Heat Transfer II:** Derivative of the energy equation. Laminar heat transfer over a flat plate. The Graetz-Nusselt problem and its solution. Turbulent heat transfer and various analogies between heat and momentum transfer. Free convective heat transfer and condensation heat transfer.

3 hours a week, one semester.

Ch.E. 505a. **Electrochemical Engineering:** Origin of the electrical potential difference. Electrolytic conduction, Debye-Huckel theory, double layer, static electrification, passage of current through electrolytic cell.

2 hours a week, one semester.

Ch.E. 506b. **Corrosion:** Clean surfaces, surface damage to metals, effect of imperfections on dissolution, electrode solution interfaces, electrolytic etching of metals, electrochemistry of dissolution, dissolution of metals, oxidation of metals.

3 hours a week, one semester.

Ch.E. 507a. **Non-Newtonian Fluid Technology:** Formulation of stress and strain tensors. Constitutive equation and its derivation. Rheological classification of industrially important non-Newtonian fluids. The viscometry of non-Newtonian fluids, non-Newtonian fluid boundary layer equation, heat transfer, pipe line design, and mixing of non-Newtonian fluids.

3 hours a week, one semester.

Civil Engineering

C.E. 500. **Advanced Mechanics of Materials:** Mechanical properties of materials; limitations of the ordinary formulae of mechanics of materials; introduction to the theory of elasticity; theory of plates and membrane stresses in shells.

2 hours a week.

C.E. 501. **Advanced Problems in Statically Indeterminate Structures:** Continuous trusses and bents; arches, rings and frames with curved members; flexible members; frames with semi-rigid connections, shear-wall structures; torsion at non-circular sections; framing systems subject to combined bending and torsion.

2 hours a week.

C.E. 502. **Advanced Structural Analysis:** Numerical methods applied to structural analysis, numerical integration, finite difference approximation, relaxation procedures; matrix analysis of complex structures, stiffness and flexibility matrices, emphasis to the application of digital computer.

2 hours a week.

C.E. 503. **Advanced Structural Mechanics I:** Beam-columns; instability of struts, frames and trusses; inelastic buckling; bending; bending of plates; buckling of plates; analysis and design of folded plate structures.

2 hours a week.

C.E. 504. **Advanced Structural Mechanics II:** Stresses in cylindrical shell roofs; membrane stresses in domes and shells of double curvatures; flexural action near boundaries: approximate methods of analysis; design considerations.

2 hours a week.

C.E. 505. **Structural Analysis for Dynamic Loads:** Behaviour of structural materials under dynamic loading; response of structures to dynamic loads; general theory for distributed mass systems; simplified analysis; energy method and numerical procedure; blast loads; design considerations.

2 hours a week.

C.E. 506. **Plastic Analysis and Design of Steel Structures:** Stress-strain relationship; moment-rotation characteristics; plastic analysis of beams and frames; estimates of deflections; minimum weight design; general loading; factors affecting the fully plastic moment; design considerations.

2 hours a week.

C.E. 507. **Prestressed Reinforced Concrete:** Principles of prestressing; prestress losses; materials; prestressing systems; analysis and design of statically determinate and indeterminate concrete structures.

2 hours a week.

C.E. 508. **Water Power:** Stream flow and water power estimates; storage problems; analysis, design and selection of water power structures and equipment; types and purposes of dams and weirs; turbine analysis; transmission lines; cost and value of water power; typical problems will be studied.

2 hours a week.

C.E. 509. **Advanced Hydromechanics:** Theory of uniform and varied flow in open channels; theory of the use of models in design; conditions for similarity in the case of hydraulic structures; elastic structures, aircraft and waves.

2 hours a week.

C.E. 510. **Advanced Water and Sewage Treatment:** Characteristics of water and sewage both chemical and biological, and their influence on the design of treatment facilities. Theory of sedimentation and flocculation, with applications to the design of clarifiers, suspended solids contact units, and grit chambers. Theory of flow through beds of solids, and its application to design of filter beds. The treatment and disposal of sludge. Miscellaneous water and sewage treatment methods and problems.

2 hours a week.

C.E. 511. **Advanced Hydrology:** Analysis and synthesis of the hydrograph by unit hydrograph. Stream-flow routing. The hydrograph as a function of drainage characteristics; estimation of runoff from Meteorological data. Infiltration theory. Sea water intrusion in coastal Aquifers. Application of hydrologic techniques.

2 hours a week.

C.E. 512. **Advanced Soil Mechanics and Applications:** Properties of soils, stresses, consolidation, settlements, bearing capacity, stability of slopes, flownets and seepage, stabilization of soils, special problems on buildings, highway and airport foundations, tunnels, underground conduits. Course includes laboratory testing.

2 hours a week.

C.E. 513. **Advanced Highway Design:** Special problems on stabilization, bases, subgrades, pavements, drainage, frost action. Emphasis on modern approach to geometric design of rural and urban highways traffic engineering. Course includes complete highway project design and occasional laboratory.

2 hours a week.

C.E. 514a. **Advanced Problems in Foundations:** Combined footings. Mat and Raft foundations, group piling, retaining walls, abutments, vibrations in foundations.

2 hours a week.

C.E. 514b. **Modern Airport Design:** Selection of site, runways, modern rigid pavements, stabilization of subgrades, frost action, drainage; course includes airport design problems and projects.

2 hours a week.

C.E. 515. **The Engineer in Public Health;** economic value of adequate water supply and proper sewage treatment; epidemiology of communicable diseases; biostatistics; food sanitation; environmental health; air pollution; collection and disposal of municipal refuse; industrial hygiene; and sanitary engineering in time of disaster.

2 hours a week.

Electrical Engineering

E.E. 500c. **Graduate Seminar:** All graduate students will attend the seminar.

E.E. 521c. **Network Analysis:** Network topology and fundamental theorems. Matrix formulation. Representation of network functions. Transform techniques and transient analysis. Two-port networks. Filter theory. Signal-flow graphs.

3 hours a week, one semester.

E.E. 522c. **Network Synthesis:** Energy functions and the positive-real function criterion. Synthesis of driving point impedance of two- and three-element (R, L, C) networks and applications. Topics in four terminal network synthesis and applications. The approximation techniques.

3 hours a week, one semester.

E.E. 531c. **Theory of Electromagnetic Fields:** Laplace's and Poisson's equations and conformal mapping. Maxwell's equations, scalar and vector potentials. Circuit concepts from field equations. Electromagnetic waves. Mode theory of cylindrical guides and resonators. Radiation and antennas.
3 hours a week, one semester.

E.E. 532c. **Advanced Electromagnetic Field Theory:** Electromagnetic potentials. Green's function. Boundary value problems. Field equivalence concepts. Spherical and cylindrical wave functions, vector wave functions. Diffraction. (Prerequisite: 531 or equivalent).
3 hours a week, one semester.

E.E. 541c. **Feedback and Control Systems:** Linear feedback control systems. Transfer function analysis. Stability, compensation. Optimization. Components of control systems.
3 hours a week, one semester.

E.E. 542c. **Advanced Control Systems:** Nonlinear systems. Sampled-data systems. Adaptive systems. (Prerequisite: 541 or equivalent).
3 hours a week, one semester.

E.E. 551. **Principles and Applications of Computers:** Logical structure of computers. Computer components and limitations. Flow diagrams, problem preparation. Principles of coding.
2 hours a week, two semesters.

E.E. 561. **Advanced Theory of Machines:** General principles of rotating machines. General equations of induced voltage, armature reaction, and torque. Steady-state and transient performance of machinery. Machine network analysis.
2 hours a week, two semesters.

E.E. 562c. **Advanced Power System Analysis:** Fundamental concepts. Torque angle characteristics. Multi-machine problems. Stability limits. Economic dispatch, impulse levels, exciter and voltage regulator response, system design.
3 hours a week, one semester.

E.E. 563c. **Power System Transients:** Travelling waves, free and forced oscillations, reflections, transition points, multi-conductor systems, multi-velocity waves, attenuation and distortion, lightening surges, switching surges, arcing grounds, protective devices, surges in transformer and machine windings.
3 hours a week, one semester.

E.E. 564c. **Tensor Analysis of Electric Circuits and Machines:** The application of dyadics, matrices and tensors to the theory of electric circuits and machines.
3 hours a week, one semester.

E.E. 565c. **Two Dimensional Fields in Electrical Engineering:** Calculation and construction of electric and magnetic fields for conductors, plates, vacuum tubes, machine slots, teeth, etc., analogous problems in fluid flow by analytic methods as well as free hand mapping.

3 hours a week, one semester.

E.E. 571c. **Solid-State Physical Electronics:** Introduction to quantum and statistical mechanics. Band structure. Conductivity, mobility and lifetime of carriers. Magnetic properties of solids. Magnetic resonance.

3 hours a week, one semester.

E.E. 572c. **Solid-State Applied Electronics:** Semiconductor physics. Transistor construction and characteristics. Transistor applications. Ferrites. Tunnel diodes.

3 hours a week, one semester.

E.E. 581c. **Communication Principles:** Transmission of information. Transmission through electrical networks. Modulation. Noise. Random signal theory. Basic information theory. Reliability of transmission.

3 hours a week, one semester.

E.E. 591c. **Principles and Techniques of Microwave:** Microwave principles. Power generation and measurement. Impedence concepts. Representation of microwave circuits. Resonant-cavity, attenuation. Spectrum analysis, microwave measurements.

3 hours a week, one semester.

E.E. 592c. **Microwave Electronics:** Transit time effects. Interaction of electromagnetic fields and electron streams. Space-charge wave. Velocity modulation tubes, crossed field tubes. Harmonic generation. Amplification.

3 hours a week, one semester.

EE. 600c. **Special Topics:** Selected advanced topics especially directed in the fields of research in the department. Consent of the instructor required.

Mechanical Engineering

M.E. 501. **Heat Transfer:** A heat transfer course covering advanced topics in conduction, convection and radiation.

2 lectures a week, first semester; 3 lectures a week, second semester; 3 laboratory hours alternate weeks, all year.

M.E. 502. **Thermodynamics of Fluid Flow:** Concepts applying to incompressible and compressible fluids, isentropic flow, Fanno flow, choked conditions, isothermal flow, varying area adiabatic flow, normal and oblique shocks, Rayleigh flow, generalized one-dimensional flow.

2 hours a week.

M.E. 503. **Theory of Viscous Fluids:** (a) Laminar Flow, Navier Stokes equations with exact and approximate solutions, approximate solution of the boundary layer by momentum theorem. (b) Turbulent Flow, general theories, wall turbulence, free turbulence.

2 hours a week.

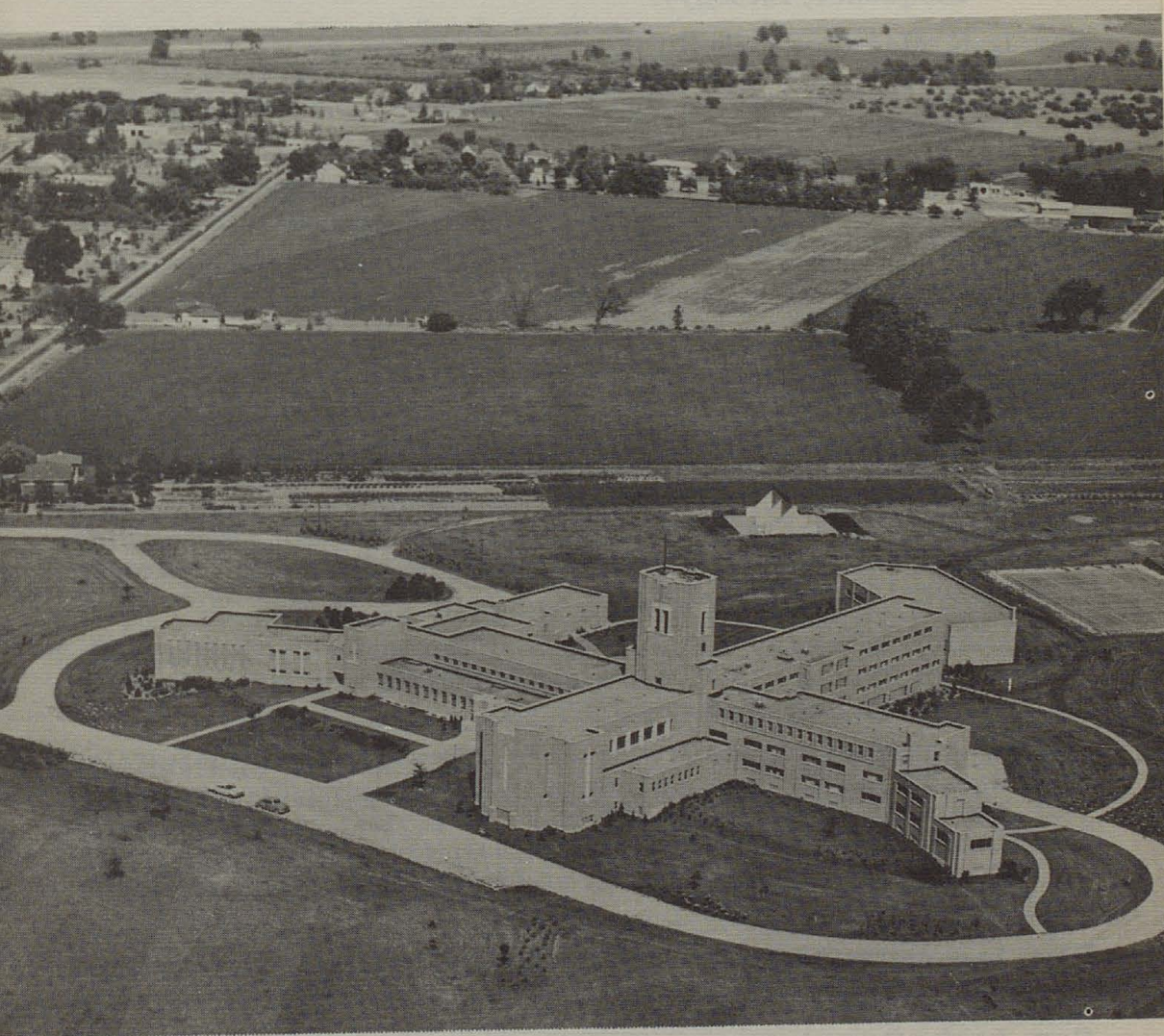
M.E. 504. **Turbulent Flow:** Navier-Stokes equations, stability of flow, origin of turbulence. Stochastic averages, methods of measurement of fluctuating quantities. Homogeneous turbulence models, velocity correlations and spectra, energy dissipation and transport phenomena in turbulent flow, Kolmogoroff's Theory of local isotropy. The structure of turbulence in shear flow, intermittency. "Absolute" and "relative" diffusion by turbulence effects of scale, application to atmospheric turbulence. The generation of acrodynamic noise in shear layers and boundary layers.

2 hours per week.

THE FACULTY OF THEOLOGY

IN

ASSUMPTION UNIVERSITY



Holy Redeemer College

THE FACULTY OF THEOLOGY

Faculty Council

The President; the Executive Vice-President; the Dean of Theology; the Principal of Holy Redeemer College; two persons appointed by the President; the Heads of Departments as follows:

Rev. E. J. Crowley, C.Ss.R., B.A. S.T.L., S.S.L., **Sacred Scripture.**

Rev. D. L. Egan, C.Ss.R., S.T.L., **Church History.**

Rev. T. I. Kelly, C.Ss.R., S.T.L., **Pastoral Theology** (Sacred Eloquence, Liturgy).

Rev. L. C. McAulay, C.Ss.R., B.A., J.C.D., **Canon Law.**

Rev. L. G. Owens, C.Ss.R., S.T.L., **Dogmatic Theology** (Spiritual Theology).

Rev. A. J. Thomas, C.Ss.R., J.C.D., **Moral Theology.**

Officers of Instruction (1962-63)

Rev. Victor C. Crean, C.Ss.R.; Instructor, Department of Pastoral Theology—1961.

Rev. Edward J. Crowley, C.Ss.R.; B.A. (St. Joseph's, N.B.), S.T.L. (Catholic U. of America), S.S.L. (Pontifical Biblical Inst.). Assistant Professor and Head, Department of Sacred Scripture —1957.

Very Rev. Charles Frederick DeVine, C.Ss.R., S.S.L. (Inst. Pont. Bibl., Rome). Principal, Holy Redeemer College and Professor of Sacred Scripture—1961.

Rev. D'Arcy L. Egan, C.Ss.R.; S.T.L. (Catholic U. of America). Dean of Faculty, 1960. Associate Professor and Head, Department of Church History—1957.

Rev. Thomas Irving Kelly, C.Ss.R.; S.T.L. (Catholic U. of America). Lecturer and Head, Department of Pastoral Theology—1959.

Rev. Louis Clark McAulay, C.Ss.R.; B.A. (St. Dunstan's), J.C.D. (Lateran U., Rome). Lecturer and Head, Department of Canon Law—1959.

Rev. Joseph McCormick, C.Ss.R.; B.A. (Western Ontario), M.A. (ibid.). Assistant Professor of Church History—1957.

Rev. Louis Gerard Owens, C.Ss.R.; S.T.L. (Angelicum, Rome). Professor and Head, Department of Dogmatic Theology—1957.

Rev. Alphonsus Joseph Thomas, C.Ss.R.; J.C.D. (Laval). Assistant Professor and Head, Department of Moral Theology—1959.

BACHELOR OF SACRED THEOLOGY (S.T.B.)

Admission requirements: A Bachelor's degree conferred upon the completion of a course approved by the Faculty Council.

General Regulations: see p. 48.

Particular Regulations: These are outlined in the **Codex Juris Canonici; Constitutiones et Regulae Congregationis Sanctissimi Redemptoris;** Constitutio Apostolica **Sedes Sapientiae et Statuta Generalia;** and the **Ratio Studiorum Congregationis Sanctissimi Redemptoris.**

Courses of study (3 years, 16½ courses):

Canon Law 10, and 2 other courses;
Church History 10 or 20;
Dogmatic Theology, 3 courses;
Liturgy 10a and 20a;
Moral Theology 10, and 2 other courses;
Pastoral Theology, 1 full course;
Sacred Eloquence, 1 full course;
Sacred Scripture 10a, and 3 other courses.

DETAILS OF SUBJECTS

Canon Law

10. **History, General Norms and Persons:** Definition, contents, significance, sources and history of canon law. Interpretation of Book I and Book II, Part I, Section I, of the Code of Canon Law.
3 hours a week.

20. **The Third Book of the Code.** Marriage legislation; sacred places; divine worship.
3 hours a week.

30. **The Second Book of the Code:** Territorial division of the Church; the ecclesiastical hierarchy from the Supreme Pontiff to Bishops; Bishops and the Government of dioceses; pastors; parochial vicars; rectors of churches. Legislation regarding religious, societies of common life, secular institutes, and the laity.
3 hours a week.

40. **The Fourth Book of the Code:** General notions regarding the procedural law of the Church, covering ordinary trials, especially marriage trials; procedure in beatification and canonization; procedure in cases decided administratively. The Fifth Book of the Code: Ecclesiastical crimes and penalties in general; medicinal penalties; vindictive penalties; penalties for certain particular crimes.
3 hours a week.

50a. **The Privileges of the Congregation of the Most Holy Redeemer:** Canonical notion of a privilege; history of the privileges granted to the Congregation; interpretation of present privileges.
5 hours a week for six weeks (half course).

CHURCH HISTORY

10. **Ancient and Mediaeval:** Selected Questions from the Ancient and Mediaeval Periods — the Church and the Jews, the Church and the Empire; the Church and the Barbarians; the beginnings of monasticism; the Church and Feudalism; the reform movement; lay investiture; Gregory VII and Boniface VIII; the Eastern Schism.
2 hours a week.

20. **Modern and Contemporary:** Selected Questions from the Modern and Contemporary Periods — Humanism; Avignon Papacy; Western Schism; Conciliarism; Renaissance; the rise and spread of Protestantism; the Catholic Reformation; Treaty of Westphalia; the decline of the Church; absolute state and secularism; French Revolution; the 19th and 20th century revival; Liberalism, Modernism, Communism.
2 hours a week.

30a. **Congregation of the Most Holy Redeemer:** The origins and development in Italy and Europe; the spread of the Congregation, with emphasis on the United States and Canda.
2 hours a week, one semester (half course).

DOGMATIC THEOLOGY

I. Dogmatic Theology

10. **Apologetics and Ecclesiology:** Nature of theology; credibility of Revelation proposed by the Catholic Church. The Mystical Body of Christ; fundamental dogma, i.e. theological fonts: Sacred Scripture and Tradition; methodology.
3 hours a week.

20. **Mystery of the Godhead and Creation:** The unity of God; divine attributes; the Trinity. Creation, general and special; Cosmogony, angels and man; the elevation and fall of man in the supernatural order, Eschatology.
3 hours a week.

30. **Grace, Incarnation, Mariology:** Sanctifying grace; justification; divine adoption; indwelling of the Trinity; merit, actual grace; the problem of free will. Christology and Mariology.
3 hours a week.

40. **Virtues and Sacraments:** The infused virtues and gifts; the virtues and gifts in general, and Faith, Hope and Charity in particular. The seven sacraments of the Church.
3 hours a week.

II. Spiritual Theology

10a. **Introduction to Ascetical Theology:** History; basic principles and their application in spiritual direction.

5 hours a week for six weeks (half course).

20a. **Introduction to Mystical Theology:** History; basic principles and their application in spiritual direction.

5 hours a week for six weeks (half course).

MORAL THEOLOGY

10. **General Introduction:** Distinctive Christian Ideal and Character of the Moral Life. Final Destiny of Man: Supernatural Ultimate End. Human Acts: man's freedom and responsibility for his actions. Norms of Morality: Law and Conscience. Sin. Virtue. The Theological Virtues of Faith, Hope and Charity and their moral implications.

3 hours a week.

20. **Special Moral:** Moral Requirements of the Virtue of Religion: Christian Worship, the First Three Commandments of the Decalogue. Moral Requirements of the Virtues of Piety and Obedience: Fourth Commandment of the Decalogue. Respect for Human Life and Personal Integrity: Fifth Commandment of the Decalogue. The Virtue of Chastity and the Sacrament of Matrimony: the Obligations of the Married State, the Violations of Chastity in Marriage and Outside of Marriage, the Sixth and Ninth Commandments of the Decalogue.

3 hours a week.

30. **Special Moral:** Moral Requirements of the Virtue of Justice: Seventh, Eighth and Tenth Commandments of the Decalogue. Truthfulness and Secrecy. Moral Obligations Arising from the Precepts of the Church. The Sacraments in general. Moral Implications of the Sacraments of Baptism, Confirmation and Holy Orders.

3 hours a week.

40. **Special Moral:** Moral Implications of the Sacrament of the Eucharist. The Sacrament of Penance: the Acts of the Penitent, the Obligations of the Confessor as Spiritual Father, Judge, Physician and Teacher. The Sacrament of Extreme Unction. Particular Obligations of the Clerical Life.

3 hours a week.

PASTORAL THEOLOGY

I. Liturgy

10a. **Theological Principles of the Liturgy:** The definition and history of liturgy. Place of sign and symbols; efficacy of these signs and symbols in sanctity and cult. Priesthood and sacrifice. Liturgy and Sacred Scripture. Liturgy in the Fathers of the Church and the theologians. Liturgy and the history of salvation.

2 hours a week, one semester (half course).

20a. **Church's Official Prayers:** A study of the Sacrifice of the Mass, sacraments, sacramentals, divine office and liturgical year, from an historical, theological, and pastoral point of view, as found in the texts of the Roman missal, the ritual and the breviary. An introduction to the liturgy of the oriental rites.

2 hours a week, one semester (half course).

II. Pastoral Theology

10b. **General Introduction:** Definition and History. Characteristics, advantages and disadvantages of present methods. Study of total human life in relation to pastoral work; supernatural and natural aspects: the supernatural is treated under the titles of Theological, Christological, Ecclesial, and Philanthropic; the natural under the divisions of Intellectual Life, Affective Life, and Physical Life.

2 hours a week, one semester (half course).

20b. **Hierarchy in Pastoral Work.** A study of bishop and diocese, priest and parish, laity and apostolate. Treatment of the relationship of the religious life and apostolic work.

2 hours a week, one semester (half course).

30b. **Pastoral Psychology and Pastoral Sociology.**

2 hours a week, one semester (half course).

40b. **Catechetics.** History of catechetics and various methods. Basic principles and special techniques. Field work: teaching in local parochial school. Methods of catechetical instruction of adults. The theology of preaching and of missions. Practical directives for pastoral work in general.

2 hours a week, one semester (half course).

50a. **The Church and Current Social Problems,** as these affect the universal mission of the Church.

5 hours a week for six weeks (half course).

50b. **The Church and Particular Social Problems** as they affect the parochial life of the Church, especially in Canada. The Redemptorist missions and social problems.

5 hours a week for six weeks (half course).

60a. **Missiology:** An introduction to the mission life in foreign countries. A study of the background, history and culture of peoples in mission areas, with a special emphasis on Japan.

5 hours a week for six weeks (half course).

III. Sacred Eloquence

10a. **Theory and Practice of Sermon Composition and Delivery.**

1 hour a week (half course).

20a. **Theory and Practice of Sermon Composition and Delivery.**

1 hour a week (half course).

30a. **Theory and Practice of Sermon Composition and Delivery.**

1 hour a week (half course).

40a. **Theory and Practice of Sermon Composition and Delivery.**

1 hour a week (half course).

SACRED SCRIPTURE

10a. **Introduction:** Inspiration; canon; texts and versions; rules of interpretation; history of exegesis; the senses of Scripture.

2 hours a week, one semester (half course).

15. **Old Testament:** Formation of the Covenanted Community of Israel: the ancestors of the Israelites (Genesis 12-50); the Former Prophets; the Yahwist literature (from tradition to literature; traditions of Genesis 1-11); Prophecy and its background; the Latter Prophets (Amos; Osee; Isais 1-39; Micheas); the Fall of the Northern Kingdom (its literature; the Elohist).

3 hours a week.

20. **New Testament:** Gospels as Salvation-History; Synoptic Gospels; Johannine literature (Gospel, Epistles, Apocalypse).

3 hours a week.

30. **Old Testament:** Last years of Southern Kingdom (its prophets; Deuteronomic reform and Deuteronomic history); Babylonian Exile (Ezechiel, Priestly Tradition; Isaias 40-66; Anawim); Restoration (last six Minor Prophets; Chronicler; Esdras); Sapiential Literature; Literary Genres of Tobias, Judith and Esther; Book of Daniel; Machabees; Essenes and other Party Movements within Judaism; Book of Wisdom.

3 hours a week.

40. **New Testament:** Acts of the Apostles; Pauline Epistles and Theology; Epistle to the Hebrews; Catholic Epistles.

3 hours a week.

EXTENSION DIVISION

University Library

EVENING SESSION

The University of Windsor offers instruction in the evening and on Saturday mornings for the benefit of teachers, business men and others whose occupations prevent them from attending day classes. Courses offered are intramural and are applicable towards degrees, diplomas and certificates. Instruction is given in each subject one evening per week or each Saturday morning throughout the academic year.

SUMMER SESSION

Instruction is offered in a Summer Session of six weeks, usually commencing the first Monday in July. Students may take a maximum of two full courses in one summer session. This summer session is intended primarily for the benefit of persons who are unable to attend the regular winter sessions as full-time students. A student who has been in attendance full-time the previous academic year may not attend the Summer Session for credit without the permission of his Dean. Students proceeding to degrees at other Universities may attend the Summer Session at the University of Windsor with the written permission of their regular university.

APPLICATION

This applies to **new students** only. Prospective students should request Form A (Application) and Form B (High School record) from the Extension Office. When these documents and all records of previous education (university transcripts and teaching certificates) have been received by the Admissions Office, the application will be considered by the Committee on Admissions. No action will be taken unless all documents are on file in the Admissions Office. To ensure early notice of acceptance, students are urged to complete their application as soon as possible.

After June 15, no applications requiring special consideration will be accepted for the Summer Session.

After September 1, no applications requiring special consideration will be accepted for the Fall Session.

The student will be notified of the Committee's decision, and if accepted, will receive a Permit-to-Register which must be presented at the time of registration.

GENERAL INFORMATION

The following programs are available by extension: Bachelor of Arts, Bachelor of Commerce, Master of Applied Science, Master of Business Administration, Certificate in Business Administration, Certificate in Public Administration, Diploma in Management, and Diploma in Nursing.

Of the 17 courses (beyond Grade XIII) necessary for the general B.A. degree, the University may accept a maximum of 12 courses by transfer from another approved university or college, provided such courses are comparable in content and weight to courses given at the University of Windsor. No more than 6, however, of these 12 courses may have been completed by correspondence.

At least two of the subjects constituting the student's major (or combined major) must be taken at the University of Windsor, regardless of the number of such subjects the student may have completed elsewhere.

For regulations governing attendance and graduation, see "General Regulations," p. 48. For regulations governing Adult Students, see p. 52.

The classification Adult Students is simply used as a category and does not mean that everyone over 25 years of age is automatically admitted to the university. It means that students in this age bracket MAY be given special consideration by the Committee on Admissions.

For subjects offered in the Extension Division and in Summer School, and for additional information, consult the Director of Extension, University of Windsor, Windsor, Ontario (Phone 253-4232, extension 267). A brochure on extension courses will be sent on request.

Registration dates:

Summer School 1963, June 22 (9 a.m. - 1 p.m.) and July 1 (10 a.m. - 4 p.m.)

Evening and Saturday Morning Division 1963. September 9, 10, 11, 12, (7 - 9 p.m.).

Prospective students are strongly advised to contact the Extension Office in advance of these dates.

Fees:

Tuition is based on the number of hours of instruction each class day during the Summer Session and Winter Evening Session:

First hour	$45.00
Each additional hour	40.00
Language laboratory fee	10.00
Science laboratory fee	30.00
Fee for evaluation of transcripts	10.00

Non-resident students (all foreign students except those whose parents have taken up residence in Canada) must pay an extra charge of $10 per hour of instruction.

NON-CREDIT

The university also cooperates with outside organizations in the administration of courses for professional training. For further information contact:

Certified General Accountants - Mr. Walter Kulyk - 252-3175

Industrial Management - Mr. George Singleton - 254-8673

Registered Industrial Accountants - Mr. Gordon James - 254-7501

SUMMARY OF REGISTRATION, 1962-63

Regular Winter Session	Men	Women	Total
Arts	560	260	820
Commerce	109	0	109
Science	269	39	308
Engineering	197	1	198
Nursing	1	51	52
Graduate Studies	71	11	82
Theology	18	0	18
Total Full Time Day	1225	362	1587
Part Time Day	65	38	103
	1290	400	1690
Extension Courses			
Summer School	387	248	635
Evening and Saturday Classes	734	330	1064
Non-credit	218	14	232
	1339	592	1931
Gross Totals	2629	992	3621
Duplicates	—243	—121	—364
Net Totals	2386	871	3257

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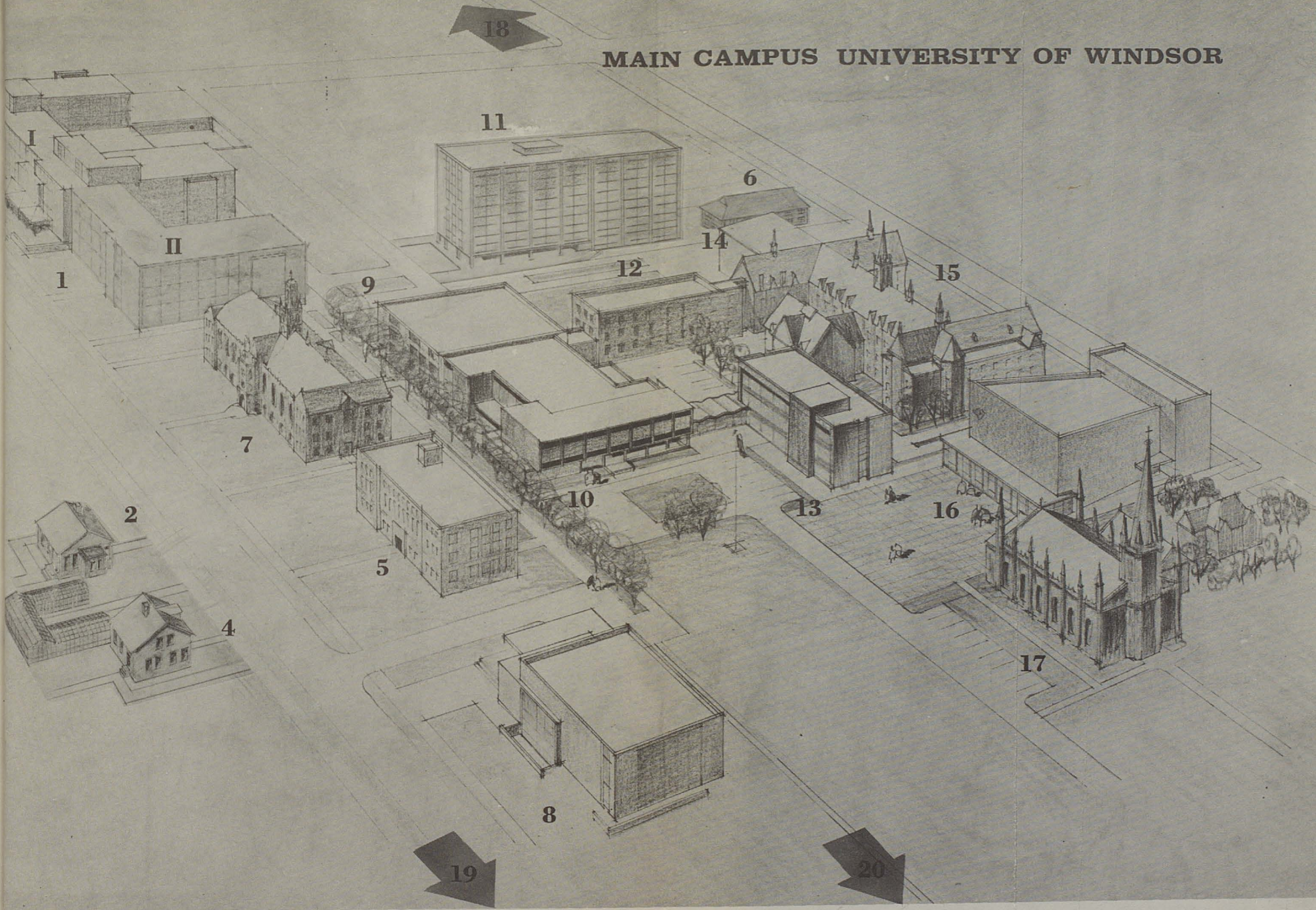

1. PURE AND APPLIED SCIENCE (Phase I, 1961, Phase II, 1964)
2. NURSING DEPARTMENT
3. BIOLOGY GREENHOUSES
4. SCHOOL OF BUSINESS ADMINISTRATION
5. MEMORIAL SCIENCE ADMINISTRATION
6. SCIENCE ANNEX
7. DILLON HALL, ARTS
8. UNIVERSITY LIBRARY (1958)
9. SAINT DENIS HALL (Enlarged 1948)
10. UNIVERSITY CENTRE (1961)
11. CODY HALL: MEN'S RESIDENCE (1962)
12. SAINT MICHAEL'S HALL (1915)
13. ADMINISTRATION BUILDING (Proposed)
14. ORIGINAL BUILDING (1857)
15. ADMINISTRATION BUILDING (1857)
16. AUDITORIUM (Proposed)
17. ASSUMPTION PARISH CHURCH (First Church 1748)
18. HOLY REDEEMER COLLEGE
19. CANTERBURY COLLEGE
20. ELECTA HALL: WOMEN'S RESIDENCE (1958-63)

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